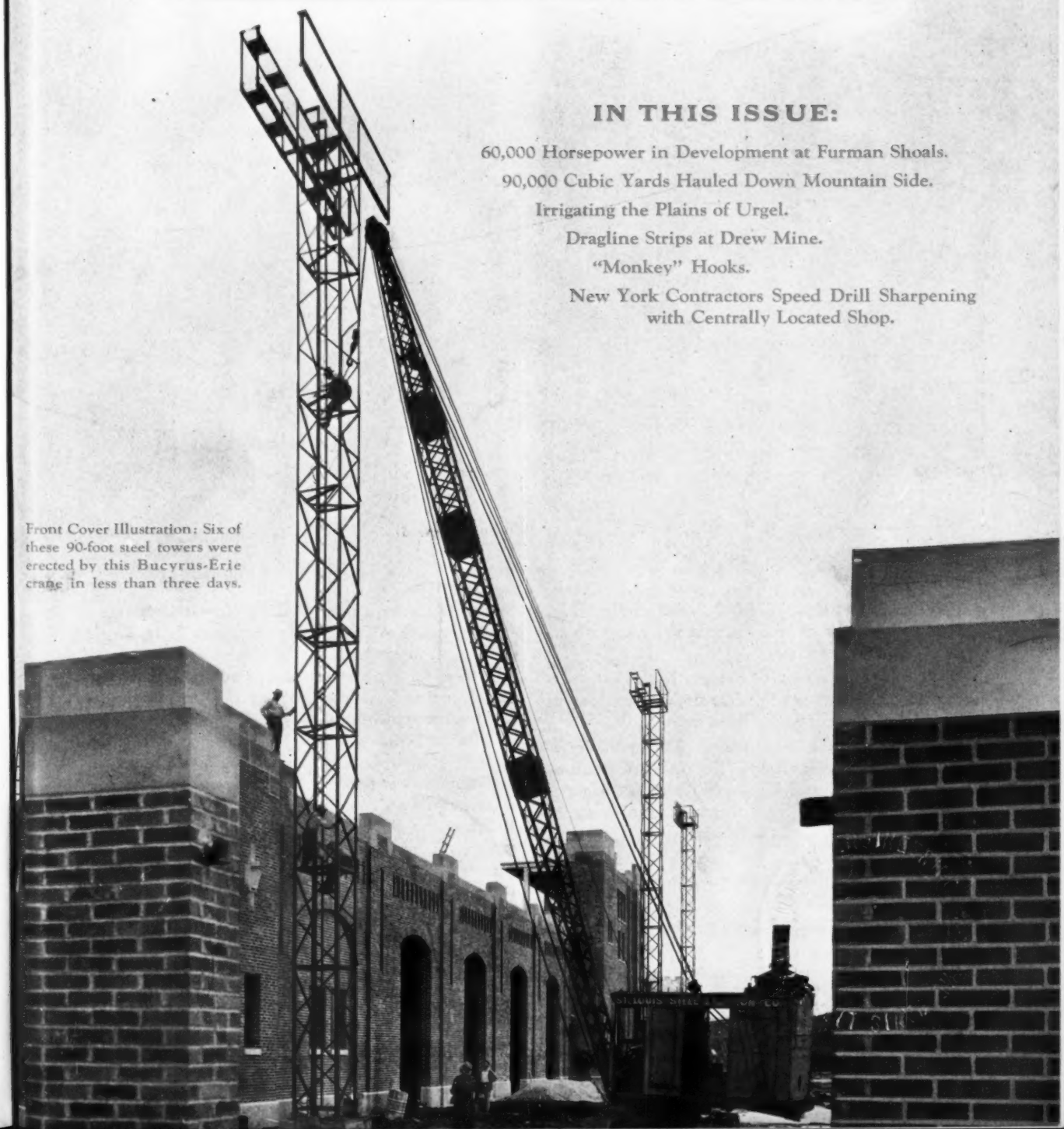
Vol. XXIV NOVEMBER 1930 No. 11

The EXCAVATING ENGINEER

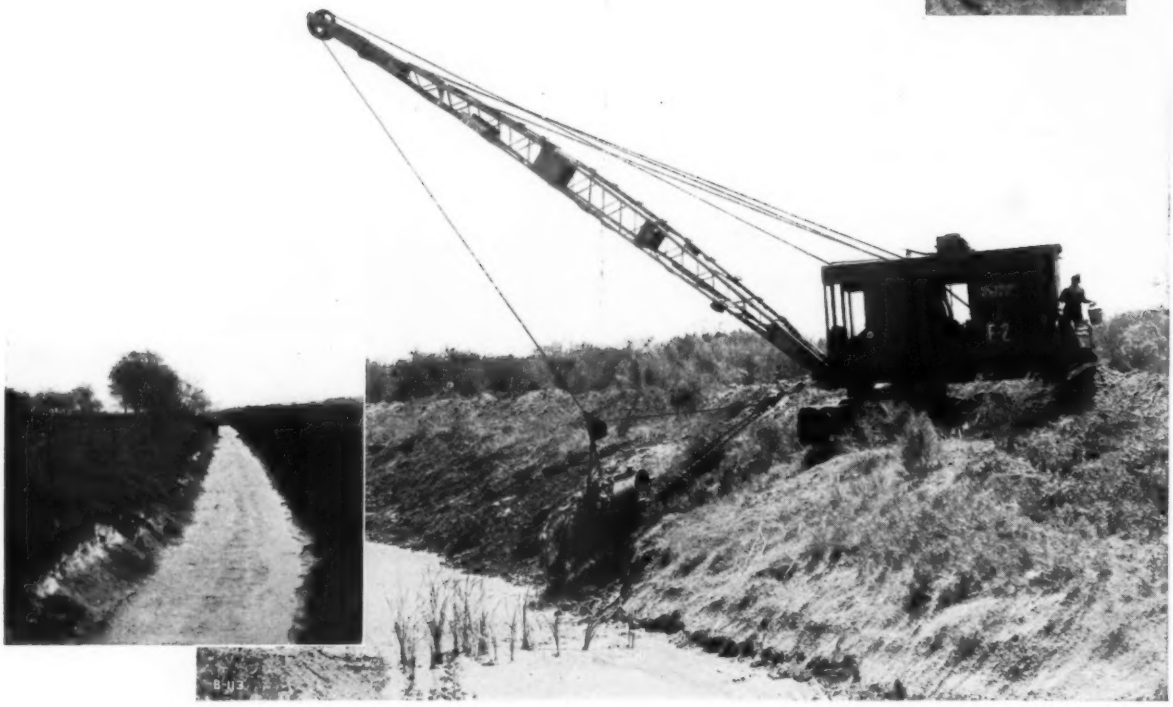
IN THIS ISSUE:

60,000 Horsepower in Development at Furman Shoals.
90,000 Cubic Yards Hauled Down Mountain Side.
Irrigating the Plains of Urgel.
Dragline Strips at Drew Mine.
"Monkey" Hooks.
New York Contractors Speed Drill Sharpening with Centrally Located Shop.



Front Cover Illustration: Six of these 90-foot steel towers were erected by this Bucyrus-Erie crane in less than three days.

How's *THIS* for Steady Winter Going?



CONTRACTOR Fred Wills of Plainville, Indiana, takes his cue for profits from the story about the tortoise and the hare.

Big yardage he wants, of course, but *steady* performance of equipment is what makes contractors well off in their old age, he believes.

Last October Mr. Wills landed a 219,000 yard drainage sub-contract—cleaning out Big-Slough Ditch and laterals near Geneseo, Illinois. With an average of 360 yards per station, here was a chance to make real profits with the right machine.

If you know Fred Wills, you know he had the right machine — a Bucyrus-Erie Diesel-powered dragline.

October 24 he moved the first yard. April 8 he finished the job. Steady? Only two shifts lost in all that time through some of the bitterest winter spells Illinois ever had! . . . Twenty and more "below" twice stopped the operators, but the machine never faltered. Just kept on week after week, bucking frozen crust and dragging in heavy, heaping $1^1/_2$-yard buckets of wet, suction-pulling sand.

The fuel costs on this job averaged only $2.40 each 12 hours. Contractor Wills got steadiness and big output — and profits, too, if rock-bottom costs mean anything.

Bucyrus-Erie Diesel-powered machines have grown up with Diesel's amazing advancement. Bucyrus-Erie built the first Diesel-powered excavator — has 40,000 Diesel h. p. in the field today. These seasoned Diesels will help you pocket more profits.

Write for specifications.

Representatives throughout the U. S. A. Offices or distributors in all principal countries. *Branch Offices:* Boston, New York, Philadelphia, Atlanta, Birmingham, Pittsburgh, Buffalo, Detroit, Chicago, St. Louis, Dallas, San Francisco.

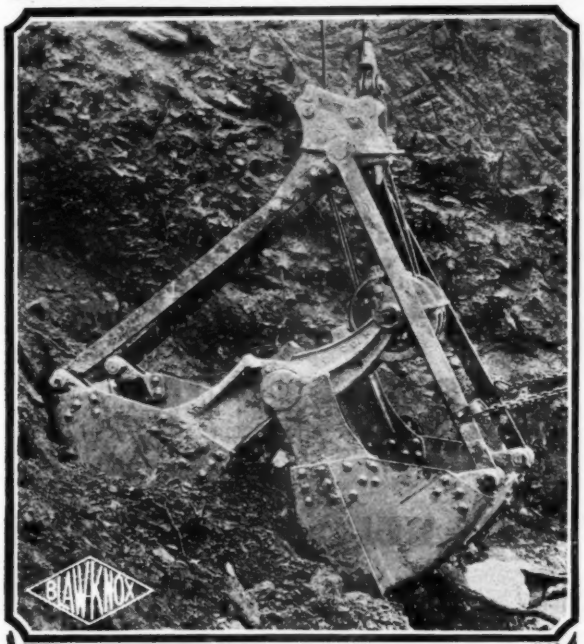
A-187—11-30—EE

BUCYRUS ERIE

BUCYRUS-ERIE COMPANY, manufacturers of the only complete line — all sizes, types and powers. *Plants:* South Milwaukee, Wis.; Erie, Pa.; Evansville, Ind. *General Offices:* South Milwaukee, Wis.

In writing to Bucyrus-Erie Company please use post card bound in the center of this number.

BUILT TO DIG



Blaw-Knox Dreadnaught Buckets are built to dig anything that can be dug with a clamshell bucket, and to stand the abuse and shocks that go with the hardest kind of digging. Construction is massive throughout, lips are scientifically tempered to resist abrasion and scoops are long and curved to offer the least resistance to penetration and flow of materials handled.

Sealed ball bearing sheaves reduce lubrication trouble to a minimum, prolong life and keep maintenance at minimum. Other details are described and illustrated in Catalog 1059—ask for your copy now.

BLAW-KNOX COMPANY
2018 Farmers Bank Bldg., Pittsburgh, Pa.

New York, Chicago, Boston, Philadelphia, Birmingham, Buffalo, Cleveland, Detroit, Baltimore

Export Division:
Blaw-Knox International Corporation,
Canadian Pacific Bldg., New York

London, England, New Oxford House, Hart St., Holborn, W. C. I.—Paris, France, 1 Rue de Clichy—Milano, Italy, 6, via S. Agnese, 6—Dusseldorf, Germany, 17 Bismarckstrasse

BLAW-KNOX BUCKETS

The Excavating Engineer

About Excavating Projects — By Excavating Men — For Excavating Men — The World Over

25 Cents Per Copy — One Dollar Per Year

Vol. 24 — NOVEMBER 1930 — No. 11

CONTENTS

Articles

60,000 Horsepower in Development at Furman Shoals 525
On the Island of Fernando Po 528
90,000 Cubic Yards Hauled Down Mountain Side 529
Irrigating the Plains of Urgel 530
Dragline Strips at Drew Mine 532
"Monkey" Hooks 532
New York Contractors Speed Drill Sharpening with Centrally Located Shop 533

Field Notes

Illinois Tests World's First Metal Base Highway 534
Precision 534
Road Building Absorbs Small Part of Motoring Cost. 534

Equipment You Ought to Know About

New 2¼-Yard Diesel Excavator Announced by Bucyrus-Erie Company 535
Gelamite Explosive Described 535
A New Portable Power Unit 535
New Light-Weight Paving Breaker 535

Editorials

The Business Situation 536
Our Front Cover 537

Shots from the Firing Line

Construction of Hoover Dam "Will Proceed with All Possible Expedition" 539
International Road Congress Meets in Washington 539
National Sand and Gravel Association Convention for St. Louis in January 539
Accidents in Quarrying Industry During 1929 Show Increase Over 1928 539
New England Notes 539
New York Notes 539
Buffalo and Vicinity 541
New Jersey Notes 541
Quaker Notes 542
Baltimore Notes 542
Southern Notes 544
Ohio Notes 544
Chicago and Vicinity 546
Iowa Notes 546
St. Louis Items 548
Missouri Notes 552
Arkansas Notes 554
San Francisco and Vicinity 554
Oregon Notes 558
Washington Notes 558

Book Reviews 560

Trade Notes 561

PUBLISHED MONTHLY BY

The Excavating Engineer Publishing Co.

F. O. Wyse, Manager-Editor — Arnold Andrews, Associate Editor

South Milwaukee, Wisconsin, U. S. A.

ADVERTISING REPRESENTATIVES

H. B. KNOX, Jr., 101 Park Ave., Room 1126, New York, N. Y.
V. G. CLYDE, 4446 No. Lincoln St., Chicago, Illinois.

Copyright 1930 by The Excavating Engineer Publishing Co.

For your convenience in writing Blaw-Knox Company you will find a card bound in this issue.

THOSE LOW DIRT MOVING COSTS YOU'RE HEARING ABOUT

ARE BEING MADE WITH ATLAS DIESELS

USED IN

Bucyrus-Erie Excavators . . P & H (Harnischfeger) Excavators . . Link-Belt Excavators . . Thew-Lorain Excavators . . Moore Speedcranes . . Plymouth Locomotives, Lidgerwood Logging Equipment.

INTRODUCED and proved by Atlas seven years ago . . . the diesel-powered excavator is *not* a new idea.

On many of the world's largest construction projects, hundreds of excavators, powered with Atlas Diesels, have been turning out phenomenal dirt-moving records for years.

The engine has been selling itself. One contractor hears that another, the former owner of a steam rig, for instance, has cut his fuel costs from $20 a day to $3. He knows that only a Diesel operates at such low costs . . . so he specifies an Atlas Diesel, for his next excavator.

No other type of engine can match the operating economies of an Atlas Diesel . . . because it uses only cheap, low-grade oil, that costs ⅓ - ¼ as much as gasoline . . . and it consumes only ½ - ⅔ as much. Fuel costs are thus cut from 75% - 85% below those of a gas. engine.

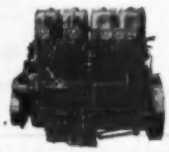
Because it doesn't choke and stall in heavy digging . . . an Atlas Diesel turns out 10% - 15% more yardage, too. The harder the going, the harder an Atlas digs. Its common-rail fuel system maintains a steady flow of power over the entire range of speeds.

Simple in construction . . . operators prefer an Atlas Diesel, once they've tried it. No boiler to tend. No water troubles. No ignition system. No spark plugs. Starts in ten seconds.

Built to stand the gaff . . . you can always depend on an Atlas Diesel. It stays right on the job, and gives uniformly outstanding performance. Rigid factory inspection assures it.

Specify an Atlas Diesel, for your next excavator. And mail the coupon for complete facts.

Bucyrus-Erie shovel, powered with an Atlas Diesel Engine.



Atlas Diesel for excavators. 4 cylinder, 4 cycle. Dust proof.

The Atlas PORTABLE *Diesel Power Unit. Cheaper fuel costs and more power—for all types of stationary uses. Mail coupon for facts.*

ATLAS IMPERIAL full diesels

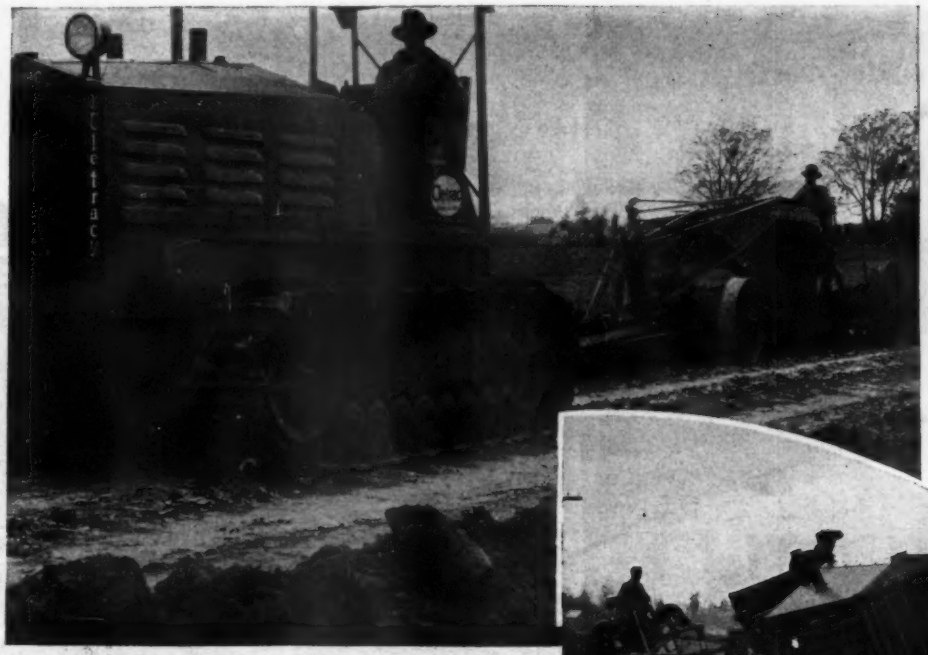
FACTORIES & EXECUTIVE OFFICES: *Oakland.* BRANCHES: *Chicago—Houston—Portland, Ore.—San Diego and Terminal Island, Calif.* DISTRIBUTORS AT: *New York—Baltimore—Philadelphia—Omaha—New Orleans—Kansas City—Los Angeles—Seattle—Portland, Ore.—Miami—Jacksonville—Gloucester—Tulsa—Boise—Tacoma—Astoria and Bandon, Ore.—Honolulu—Manila—Vancouver, B. C.—Hyacinthe, Quebec.* FOREIGN DISTRIBUTORS AT: *San Jose, Costa Rica—Lima, Peru—Rio de Janeiro, Sao Paulo, Recife, Porto Alegre and Rio Grande do Sul, Brazil—Santiago, Antofagasta and Iquique, Chile—Guayaquil, Ecuador—Cristobal, Canal Zone—Buena Ventura, Colombia—Bangkok, Siam—Papeete, Tahiti—Auckland, N. Z.—Sydney, Australia.*

ATLAS IMPERIAL DIESEL ENGINE CO., 2867 Glascock St., Oakland, Calif., *Please mail free booklet.*

Name _____

Address _____ *Use* _____

In writing to Atlas Imperial Diesel Engine Co. please use coupon or post card bound in the center of this number.



POWER THAT NEVER LAGS

WORK moves swiftly — surely — when Cletrac power and traction are on the job. Blades bite deeper — stubborn earth and rock yield quicker — heavy loads move faster—time and labor are saved.

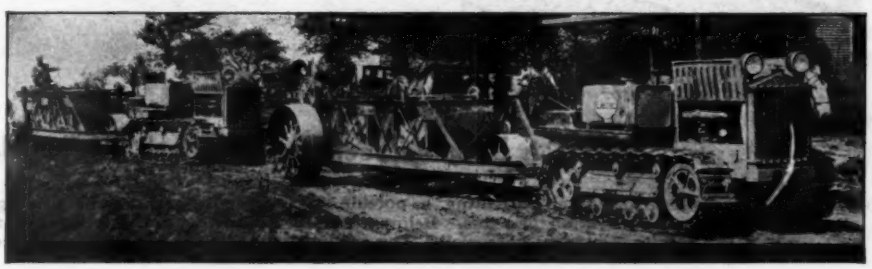
Whether it's on a road doing maintenance work, down in the mud of a drainage ditch, levelling ground for an airport, building a dam, or handling any one of countless outdoor jobs, Cletracs perform with an energy and speed that clip costs on contracts and make appropriations go farther.

Cletracs have power to spare for heavy loads and hard pulls. Their broad steel tracks grip surely and firmly in bad footing and on steep grades. They control easily. They are economical. They have the stamina and strength to stand up under the most gruelling service. In every detail they measure up to the very highest tractor standards.

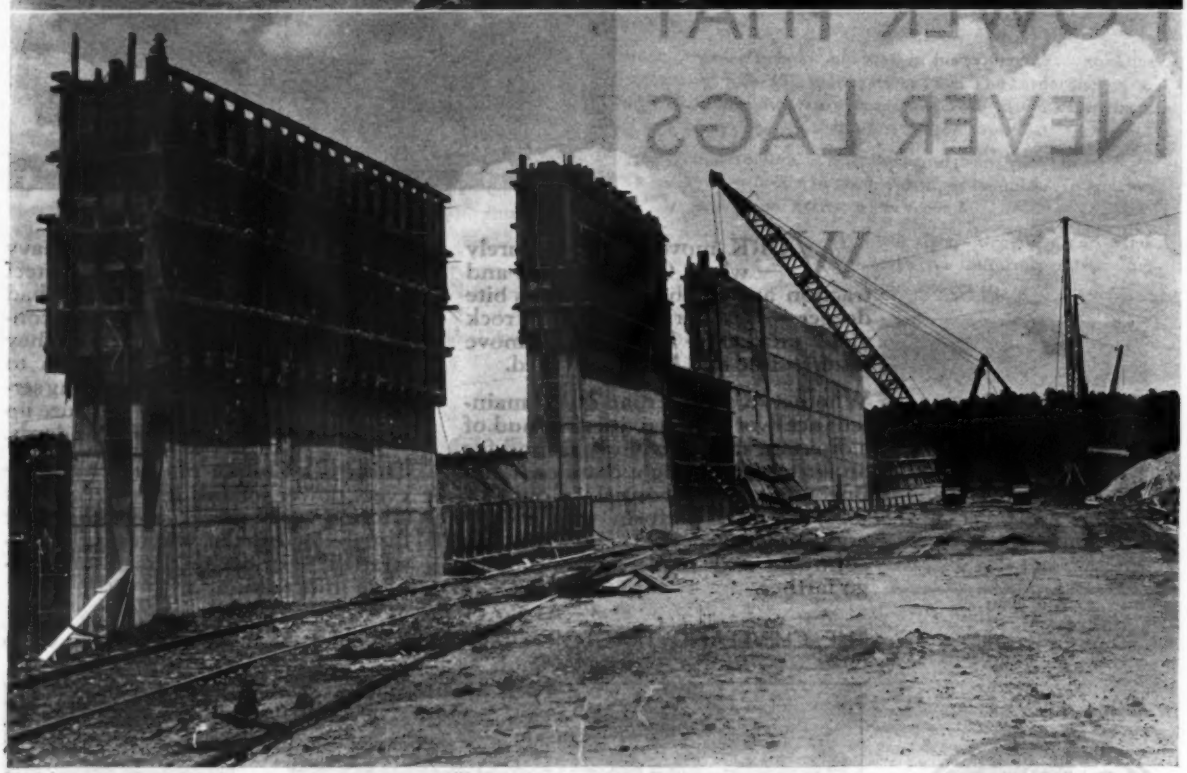
There is a Cletrac of correct size for every power job in highway, contract and industrial work. See the Cletrac distributor nearest you for a demonstration — or write direct for complete information.

THE CLEVELAND TRACTOR CO., 19327 Euclid Avenue, Cleveland, Ohio

Cletrac
Crawler Tractors



In writing to The Cleveland Tractor Co. please use post card bound in the center of this number.



This Dragline Seems to Be a Jack-of-all-trades

Above — Bucyrus-Erie dragline excavating a portion of the earth overburden overlying the tailrace canal. There were about 30,000 yards of excavation like this. Below — The dragline removes a section of panel forms from the upstream side of the partly completed core wall. The sections of the wall at the right are completed as to height.

The EXCAVATING ENGINEER

Vol. XXIV NOVEMBER 1930 No. 11

60,000 Horsepower in Development at Furman Shoals

Allied Engineers, Inc., use dragline to distribute concrete and handle forms on this interesting Georgia power development.

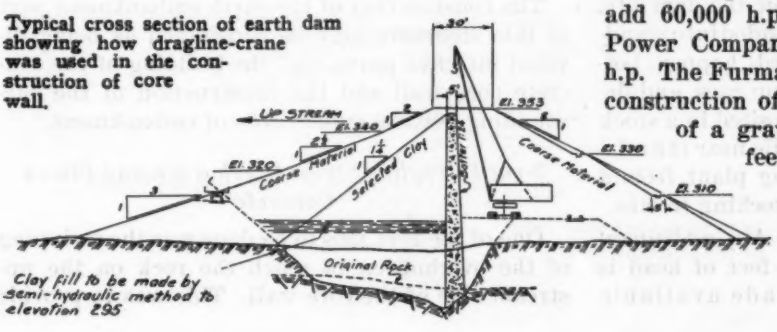
◆ ◆ ◆

By
A. T. BEAUREGARD,
Field Engineer

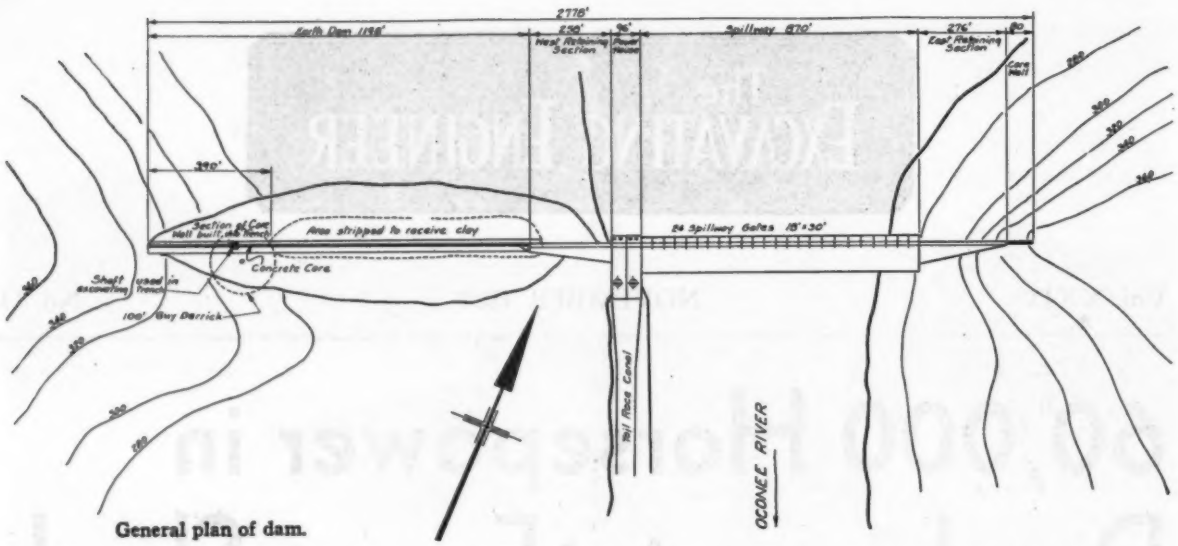
The ¾-yard Bucyrus-Erie steam shovel had a tough job in moving these piles of broken rock in the powerhouse and tailrace areas.

ONE of the most interesting construction features of the Georgia Power Company's new hydro-electric development on the Oconee River near Milledgeville, Georgia, has been the use made of a Bucyrus-Erie dragline excavator. In addition to the usual work in excavation, this equipment has been used very satisfactorily to place, at the time of writing, about 22,000 cubic yards of concrete and for handling the necessary forms in the construction of a wall 800 feet long and 80 feet high.

Typical cross section of earth dam showing how dragline-crane was used in the construction of core wall.



When Allied Engineers, Incorporated (successors to Dixie Construction Company), complete this development at Furman Shoals in 1932 it will add 60,000 h.p. to the capacity of the Georgia Power Company's system which is now 501,000 h.p. The Furman Shoals development includes the construction of a dam 2,800 feet long, consisting of a gravity concrete spillway section 870 feet long with a 1,200-foot long earth embankment surrounding a concrete core wall, plus concrete abutments and headworks. The dam will impound a lake covering about 14,000 acres, whose



General plan of dam.

capacity is approximately 7½ million cubic feet of water.

With a head averaging 85 to 90 feet, concrete penstocks will carry water to the runners of two 30,000 h.p. vertical turbines of the Francis type. Transformers at the plant will step up the generator voltage of 6,900 to 110,000 and 44,000 volts for feeding the Power Company's transmission lines.

Plant Layout Principal Factor in Obtaining Low Unit Cost

The plant layout for obtaining and handling concrete materials has been the principal factor in reaching a low unit cost per cubic yard of masonry. Cement, received in bulk, is unloaded by means of a power hoe into a bucket elevator, and then passed through screw conveyors into silos. Sand is dredged by a 6-inch pump from the river bed a short distance below the dam site, loaded into standard hopper bottom cars, and deposited in a stock pile near the mixing plant from a stocking trestle.

The core wall under construction with the dragline placing concrete for the core wall.

An additional 8 feet of head is made available for the turbines by the excavation of a tailrace canal in the solid rock, yielding the coarse aggregate for the job at a price much under competitive commercial rates on aggregates from other sources. A saving in the volume of cement is being realized through the use of 8-inch cobble stones which are separated from the product of a 60-inch primary jaw crusher and are run directly through two 2-cubic-yard tilting mixers.

In cleaning-up to bed rock preparatory to sluicing in the clay on the upstream side of the concrete, core wall material was shoveled into scale pans which were lifted over the 30-foot wall and dumped by the Class-14.

The construction of the earth embankment part of this structure may be considered as being divided into two parts, viz., the building of the concrete core wall and the construction of the surrounding 500,000 cubic yards of embankment.

2-yard Dragline Strips Overburden and Places Concrete

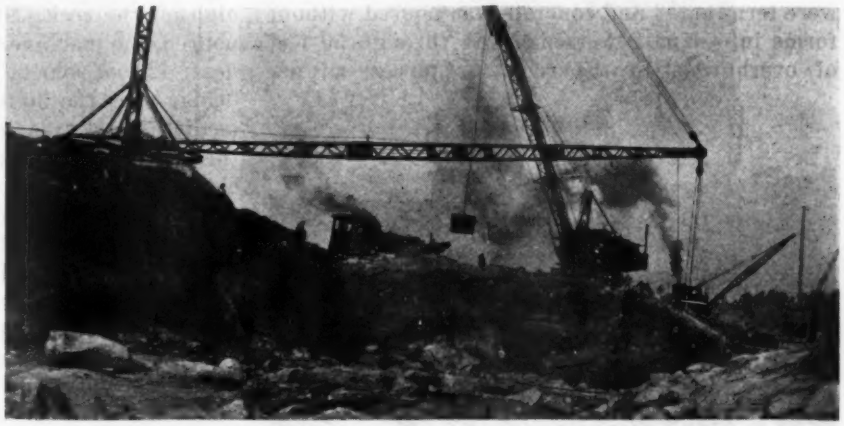
One of the first jobs to be done was the stripping of the overburden to reach the rock on the upstream side of the core wall. This was to provide

good bond for the upstream clay core which will lie against the concrete core. In two cuts a Class-14 Bucyrus-Erie dragline excavated a strip about 80 feet wide, 12 feet deep, and 800 feet long, the spoil being thrown into the upper and lower toes of the main embankment. The embankment on the downstream side was made as high and as broad as possible. After the completion of the excavation the dragline then leveled off a berm on this embankment over which it traveled back and forth while it placed concrete in the wall. A railroad track for the delivery of concrete and forms was brought up from the plant on to the berm.

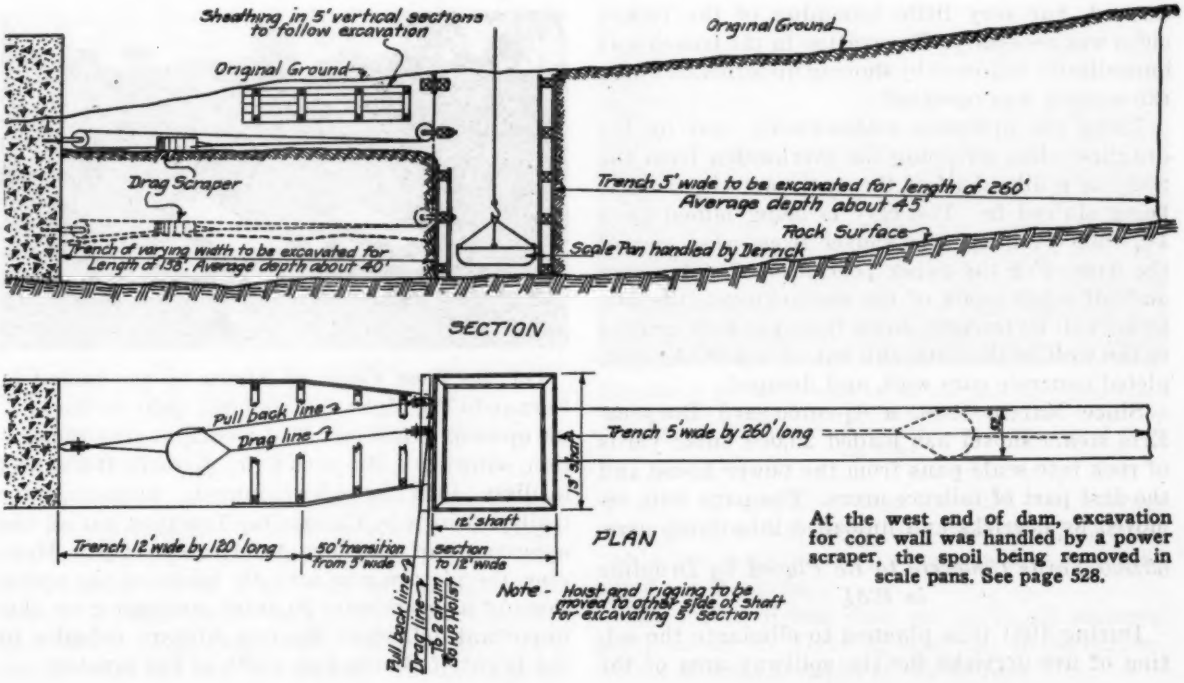
Handling concrete in two-yard buckets, the core wall was built up by the Class-14 from the rock, level with the top of the berm, approximately a distance of 30 feet. Additional fill was then brought in and dumped against the wall built, on the downstream side, allowing the dragline to be moved up closer to the masonry in order to reach the final 50 feet of height. Fitted with an 80-foot boom the dragline easily reached the full length of the 50-foot blocks with only one move-up during a pour. The wall was built in alternate blocks 50 feet long, each lift being 10 feet high. Forms of heavy construction were made in panels 18 feet by 10 feet. The number of panel forms built for the wall was 54, each one being used about 15 times.

Saved Costs on Four 100-foot Boom Derricks

The machine was operated almost continuously on single-shift work for a period of four months. In moving from block to block, as much as 500 feet in a day, time lost in travelling was negligible. Although assisted occasionally by a locomotive crane in the handling of forms, the dragline readily placed between 5,000 and 7,000 yards in a month of single-shift work. Placing and stripping forms,



Where the concrete core wall joins the west abutment. Although most of this area was within the reach of the derrick shown, all of the concreting possible was done by the dragline.


Sheathing in 5' vertical sections to follow excavation
Original Ground
Original Ground
Drag Scraper
Trench of varying width to be excavated for Length of 138'. Average depth about 40'
Trench 5' wide to be excavated for length of 260' Average depth about 45'
Rock Surface
Scale Pan handled by Derrick
SECTION
Pull back line
Drag line
Trench 12' wide by 120' long
50' transition from 5' wide
12' shaft
section to 12' wide
Trench 5' wide by 260' long
13' shaft
PLAN
Note - Hoist and rigging to be moved to other side of shaft for excavating 5' section
Pull back line
Drag line
To 2 drum 30 HP. Hoist

At the west end of dam, excavation for core wall was handled by a power scraper, the spoil being removed in scale pans. See page 528.

rather than concrete handling capacity, were the factors controlling speed. Pours of over 500 cubic yards per shift were not exceptional. The use of the dragline for this work eliminated the installation and dismantling charges of at least four 100-foot boom derricks.

At the extreme west end of the core wall where it meets a sharply rising hill, stripping operations were terminated and concrete was poured without forms into a narrow trench dug through 50 feet of overburden to the rock. A power scraper

Bucyrus-Erie ¾-yard steam shovel excavating rock at the beginning of the tailrace canal. The powerhouse area lies just in front of the cofferdam shown. This was also excavated by the shovel, the average depth being 40 feet.

dragged earth from both ends of the deep trench toward the center where a 12-foot square shaft was sunk. By means of a derrick, spoil was removed in scale pans from the central shaft. As the width of the scraper was almost the width of concrete desired, but very little trimming of the trench sides was necessary. Excavation in the trench was immediately followed by shoring underneath which the scraper was operated.

Using the upstream embankment, cast by the dragline when stripping the overburden from the rock, as a dike, half of the upstream clay core is being sluiced in. The clay is being mined by a 1¼-cubic-yard electric shovel from west end of the dam. For the upper portion of the clay core and all other parts of the embankment, the material will be brought down from the high ground to the west of the dam, run out on top of the completed concrete core wall, and dumped.

Since March, 1930, a ¾-cubic-yard Bucyrus-Erie steam shovel has loaded 25,000 cubic yards of rock into scale pans from the power house and the first part of tailrace areas. The pans were removed by derricks and unloaded into dump cars.

65,000 Yards Concrete to Be Placed by Dragline in 1931

During 1931 it is planned to eliminate the setting of five derricks for the spillway area of the concrete gravity section by the use of the dragline in placing 65,000 cubic yards of concrete. To be built in alternating blocks of 30 and 42-foot widths, it is planned to utilize the equipment to place concrete, handle forms, and clean foundations for the spillway. The caterpillar-mounted dragline will move across the river from west to east, traveling on top of the 42-foot blocks, approximately 22 feet high off the rock. Starting from a block already poured, the machine will place the concrete in the next 42-foot block ahead. Heavy girders will bridge over the 30-foot spaces left for the intermediate blocks. After reaching the east bank of the river the machine will be ramped up to a new elevation sufficient to enable it to top out the spillway deck. Moving from east to west the machine will complete the entire east half of the dam.

A 2½-cubic-yard Bucyrus-Erie railroad shovel, mounted on cats, has started the 180,000-cubic-yard solid rock excavation of the mile long tailrace canal. The dimensions of the canal are 60 feet wide and an average of 28 feet deep. It is planned to drill this excavation in two 14-foot cuts, and to remove only the top half of each cut at a time. A service track will follow the cut down on benches.

The work on the Furman Shoals hydro-electric development is being directed by C. D. Riddle, Superintendent for Allied Engineers, Inc. Frank Smith is Assistant Superintendent. The writer is in charge of engineering. T. M. Hawn is the operator of the dragline.

On the Island of Fernando Po

Off the West Coast of Africa on the Island of Fernando Po, highways are built quite in the newest up-to-date fashion. The accompanying illustration, showing a Bucyrus-Erie, ¾-yard, B-3 shovel loading into crawler-mounted, large-capacity trailers drawn by Caterpillar Tractors, has all the appearance of a modern American road job. However, the picture was actually taken on the operations of a progressive Spanish contractor on this important Island of Spain's African colonies in the Bight of Biafra just north of the equator.

A pretty cut. With plenty of wagons the GA-2 moved 36,425 cubic yards, cut measurement, in the first 25 working days — which is stepping right along.

90,000 Cu. Yds. Hauled Down Mountain Side

Nello L. Teer outfit turns out big production on Virginia road job.

ON Virginia State Highways 18 and 20, 90,000 cubic yards of dirt were needed to fill the approaches to the new bridge just out of Brookneal. The cut to supply this was not a great way off, but though the haul only averaged 750 feet the load had to go down a Virginia mountain side that drops 50 feet in 200.

Contractor Nello L. Teer of Durham, North Carolina, was awarded the contract, and sent Superintendent Tom L. Higgs out on the job with one of his Bucyrus-Erie Gas + Air shovels, three Creeper Wheel-mounted Beihl trailers, three Caterpillar Sixtys and another Caterpillar equipped with a bull-dozer.

"There she is, boys," said Mr. Teer, "let me see what you can do."

The Gas + Air in the start of the cut load into Caterpillar-drawn Beihl wagons. Note the large stump just caught by the camera. The Gas + Air tossed out a number of these big ones.

They opened up the big cut on the 27th of March and at the time of our interview with Mr. Higgs had worked 14½ days and moved a little over 21,000 cubic yards. That's an average of better than 1448 cubic yards bank measurement per 10-hour shift. The best single shift totaled 2180 yards, which is a real day's work. The average for the first 25 working days exceeded the average made the first 14½ days, for a total of 36,425 cubic yards, cut measurement, were moved — over 1457 cubic yards per day.

The job is of less than one mile, all material going in one fill. Grading is 35 feet at the bottom, with a maximum depth of cut 48 feet.

Irrigating the Plains of Urgel

Constructora Bilbaina use Diesels to excavate fifty miles of canal on one project in Northeastern Spain

José Martin y de Largarica.

RECENTLY your correspondent had the pleasure of visiting a most important contract which Constructora Bilbaina are carrying out in the Northeast of Spain on the fertile plain of Urgel (Cataluna), where fruit of all descriptions is grown in profusion, due to irrigation from the Segre, tributary of the Ebro.

The particular work visited was the construction of a sub-canal, 80 kilometres (about 50 miles) in length, called the Sub-Canal de los Riegos de Urgel, named thus because it is an auxiliary canal to that already constructed, known as the Canal de Urgel, which is 145 Kilometres (90 miles) long and the construction of which cost 70,000,000 pesetas. The total amount of excavation in this new canal consists of some 1,200,000 cubic metres (1,569,600 cubic yards), and on this Constructora Bilbaina are using their three Bucyrus-Erie E-2 Diesel machines, two as draglines and one as a shovel. This well-known contracting company of Bilbao, Spain, also are owners of two Bucyrus-Erie D-2 Diesel excavators, all of their excavators being furnished with both shovel and dragline equipment.

The Urgel canals and very many other projects constitute the ambitious plan for irrigation work which is spreading all over Spain, particularly during the last few years, carried out by the Confederaciones Hidrograficas.

Tremendously Increased Land Values Result from Irrigation Works

One of the most important amongst these Confederations is the one known as the Confederacion del Ebro, who are responsible for the above work. According to information from that Confederation, these projects, and those contemplated, will have a great influence on the future of Spain, as can be seen merely by noting the increasing value of those irrigated territories and those about to be irrigated by the canal and sub-canal of Urgel and its tributaries.

Juan y de Largarica.

Before beginning the irrigation by the Canal Urgel, a hectare of land was worth 500 pesetas, while today it is worth about 3,500. This amounts to a value of 200,000,000 for the total area, of which 150,000,000 are due solely to the irrigation schemes.

When the work of the Confederacion del Ebro in the River Segre is finished, the value of the land in Urgel will amount to 5,000 pesetas per hectare,

Taking out the second lift with dragline working in bottom of first cut. Tough digging to put a dragline into, isn't it, but the E-2 Diesels handled it very successfully and were able to spoil the material in one cast, while a shovel would have had to use hauling equipment or rehandling.

While the draglines excavate closely to required cross-section in the hard material excavated, in order to secure the perfect profile desired, crews of native laborers with picks and shovels follow the machines to trim slopes and spoil piles.

which, when applied to the 62,000 hectares available, plus those which will be irrigated by tributaries, will give the fantastic figure of 400,000,000 pesetas, with an increase in agricultural wealth of 2,000,000.

Nearby Towns Flourished in Days of Caesar

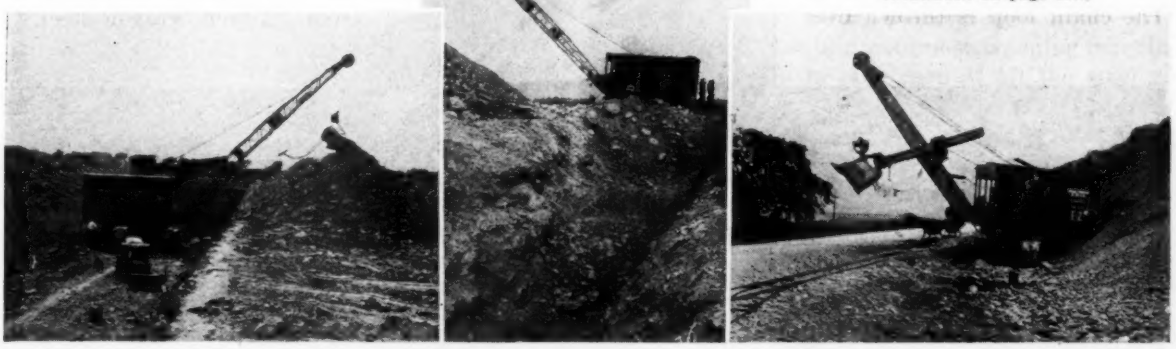
It is indeed interesting to see these up-to-date machines, a mark of the modern progress of Spain, working within sight of the ancient towns of Lerida and Balaguer. These towns date back to the very earliest times in history, and have behind them an enormous amount of historical interest, standing as they do in strategic positions close to several passes through the East Pyrenees across the Catalonian Coast Range to the plain of Aragon. For instance, Lerida dates back, and is definitely traceable in history, to B. C. 49, when Caesar took the town from Pompey's legates. From this time on it had a chequered career, being captured successively by the Goths, the Moors, the French and the Spanish. The town is built on the plain on the River Segre around a hill on the top of which stands a castle dominating the town, in general appearance exactly similar to the ancient town of Balaguer, which is dominated by the famous Carmelite Monastery of Santo Cristo de Balaguer.

Construction of Canal Presents Difficulties

After this short historical digression, we return to the modernizing of this district and the irrigation work being carried on by the Constructora Bilbaina, S. A. The canal which they are constructing has an average top width of some 8 metres (25.84 feet) and a depth of about 3 metres (9.84 feet) on the average, although in some parts it goes down to as much as 5 or 6 metres (16.4 or 19.8 feet). The slopes are in parts 1:1 and in other parts 1:1¾.

The construction of this canal presents considerable difficulties and is particularly interesting for this reason. The ground varies from earth of a reddish sandy variety to a hard sandstone rock, which has to be blasted, and in places a stratum of limestone about a meter (3.28 feet) thick. In other portions there is ce-

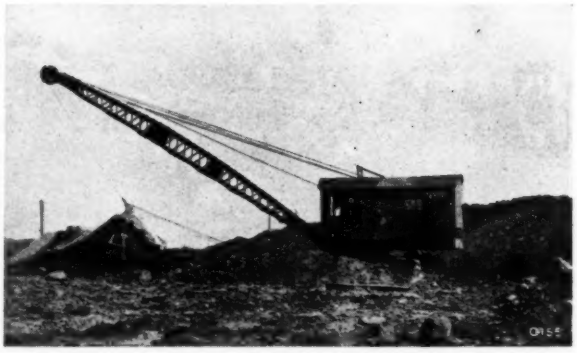
(Continued on page 537.)



Constructora Bilbaina use these three Bucyrus-Erie E-2 Diesels to handle the 1,569,600 cubic yards of excavation required for the Sub-Canal de los Riegos Urgel.

Dragline Strips at Drew Mine

EAST of Chisholm on Minnesota's Mesabi Range, the Dohm Mining Company — John W. Dohm, President, General Offices, Hibbing — is opening up a new small mine called the "Drew." The size of the pit, depth of overburden and width of the ore body fortunately are such that stripping part of the mine with a 2-yard dragline is practical. A Bucyrus-Erie 50-B electric with a 50-foot boom is used to cast the overburden to the side of the pit, eliminating the need for locomotives and cars, as well as track and dump expense. 50,000 cubic yards can be handled in this way, and then the 50-B will be converted to a shovel to remove the remaining 150,000 cubic yards of overburden, loading to cars, after which it will be used to excavate the iron ore.



Electric dragline used to strip 50,000 yards; then to become electric shovel to load remaining 150,000 yards overburden and the 300,000 tons of iron ore.

The ore body averages about 100 feet in width and 70 feet in depth, with an average overburden of 30 feet. The ore will run, according to average of drill holes, 50 per cent iron and 18 per cent silica, there being about 300,000 tons available.

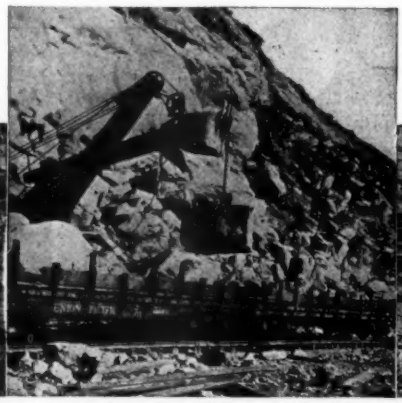
C. L. Lovoas is Superintendent for the Dohm Mining Company, with George Larkin and Dave Baldwin, operators of the dragline-shovel.

"Monkey" Hooks

Reprinted from *Rock Products* by special permission.

FOR loading rip-rap, the Hauser Construction Co., at Riverside, California, has two 50-B Bucyrus shovels with a 1¾-yard American Manganese Steel Co.'s Vanderhoeff bucket. Chain slings are used for most of the 5 to 15-ton pieces of rip-rap, but an ingenious device known as a "monkey" hook is also used for handling stone to the cars. This consists of a heavy chain which passes through the eye of two hooks, forming an enclosed loop. The chain loop is thrown over the tooth of a shovel and the monkey hooks dropped over the stone, and when the lifting pull is put on, owing to the design of the tongs, the hooks close on the rock. An idea as to the shape of these tongs can be obtained from the illustrations, and it was emphasized by the users that for proper functioning of the tongs considerable experimenting was necessary to obtain by experience the proper length and shape of the tines. The tongs were fabricated from 1¾-inch octagon steel.

Monkey tongs for rip-rap.



Shovel loading rip-rap with chain sling.

Courtesy Rock Products.

Showing construction of tongs.

New York contractors speed drill sharpening with centrally located shop

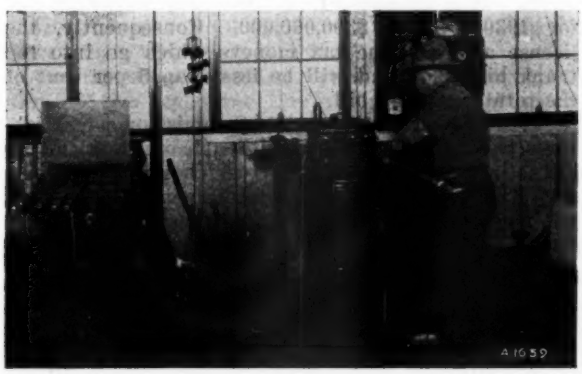
Better results are obtained, according to Poirier and McLane, from their permanent blacksmith shop than from temporary shops on their various jobs.

By LESTER H. BURNS

POIRIER & McLANE, contractors of Yonkers, New York, have given much thought and study to the question of supplying properly sharpened and shanked drill steel to the various points where they have work in process. As a general rule, the duration of their jobs is not long, and much of the work is spread over a considerable area. They have found that, all things considered, better results are obtained from a permanent, centrally located blacksmith shop than from temporary shops on their various jobs.

The first centrally located shop worked out so well that the contractors recently decided to erect a permanent building for this class of work, and to equip it with the newest and most up-to-date compressed-air-operated machines. This shop is located at the northern limits of the City of Yonkers and at a point close to the main highways, which afford easy access to all points in the country. It is a steel-frame building having four extra large windows and two garage-type doors, which, when thrown back, open the entire front and admit light and air.

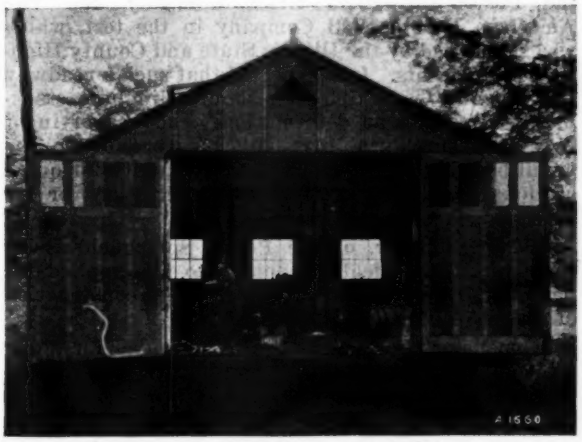
The equipment in the shop consists of an Ingersoll-Rand drill steel sharpener, an oil furnace, a



The Ingersoll-Rand No. 34 drill sharpener and oil furnace.

pedestal grinder, and other accessories, all of which are operated by compressed air furnished from an Ingersoll-Rand Class ER stationary compressor, electric-motor-driven.

Those who have had much experience in rock work agree that more than half of all rock drill troubles is directly traceable to the poor condition



The blacksmith shop of Poirier and McLane. Note how the truck can back up to the door of the shop as it would to a loading platform.

of the bits and shanks on the drill steel. They also agree that the best steel available is by far the cheapest in the long run.

Poirier & McLane have found that their blacksmiths work much more efficiently in a centrally located permanent shop than in temporary shops located on the various jobs. In other words, the bits are dressed better and are tempered better in a permanent shop than could be hoped for in temporary shops.

The capacity of one modern sharpening machine is great enough to take care of all the steel required on a number of ordinary contracting jobs. It is not uncommon for a good operator and a helper to sharpen and temper as many as 500 drill steel in an eight-hour shift; and such steels are true to shape and gauge, and are absolutely symmetrical. The cutting edges form a perfect 45-degree angle, and the corners of the bits are brought out full. The steel is also worked at the proper temperatures so as to avoid "cold-shots," decarbonization, cracks, and internal stresses and strains.

(Continued on page 537.)

FIELD NOTES

Illinois Tests World's First Metal Base Highway

The world's first metal base highway was recently completed at Springfield, Illinois. Many officials of the iron and steel, brick and allied industries, as well as highway organizations were here in Sangamon County, made famous by the pioneering of Abraham Lincoln, to watch the construction of the world's first highway with an iron base and curb.

Iron plates rolled at Middletown, were put down on the rolled and levelled sub-grade and then the 150-foot section was covered with a mastic sand cushion, and the brick wearing surface. The National Paving Brick Manufacturer's Association co-operated with the Poston-Springfield Brick Company and The American Rolling Mill Company in the test, which was supervised by the Illinois State and County Highway departments. It is expected that such a roadway will not only be flexible, but should eliminate cracking and permanent deformation. The use of ingot iron will insure durability. Other features of the new metal base highway will be the opportunity for quick sectional repairs if they are ever necessary, or for speedy surface repairs.

W. H. Moseley, of the Poston-Springfield Brick Company, Springfield, Illinois, who has applied for patents on the idea, promoted the actual construction of a road in Sangamon County.

Expansion and contraction is provided for along the center line, where the end of one sheet is laid on the edge of the adjoining sheet, to provide free movement. One transverse edge is turned down to grip the roadway, whereas the other edge lying transverse to the road is supported upon the adjoining plate section. The end of the plate section at the edge of the highway pavement is turned up to form a retaining wall for the brick or other paving material.

Precision

Does your excavating job move ahead with precision?

If it does not it's up to you to find out what is hindering its regular progress and remove the cause.

I went out yesterday where they were excavating for the basement of a big theater. I had spent some forty years on excavating contracts of my own and now I wanted to stand and watch how the other fellow did it.

Well that contractor sure had a dandy little steam shovel. It only scooped out a yard at a time but it bit out that much almost in the winking of an eyelash, four swings and the dump-truck was full and pulled out, and then —

Say, it was not my job and I had no call to interfere, but it was a shame the way they kept that efficient little steam shovel waiting! Though there were three empty trucks waiting when the loaded one pulled out, there was none of them in any sort of position. By actually timing the next truck getting into place to be loaded, I found it took just two minutes longer than it had taken to load the one that had just pulled out. And the other two trucks did not do much better when their turns came.

Finally they were all off and then the little steam shovel exercised itself for nearly ten minutes tearing up a hard patch in the excavation. And to me it seemed that also was wrong, all wrong. That hard place should have been loosened by a charge of dynamite the night before and the steam shovel should have been loading other trucks with the loose dirt.

There was inefficiency at the dump, too. You can't fool me. Forty years of excavating has taught me that when a bunch of trucks pull out of a pit with a space of several minutes between each truck and come back all in a bunch they are generally not being dumped with precision.

Now a little planning would have enabled those trucks to have pulled in that pit around behind the steam shovel and to have pulled directly into place instead of waiting for the loaded truck to pull out and then backing in.

Glory be but it got me all worked up to watch that little shovel working with the precision of a watch, and then see all this admirable efficiency set at naught by a bunch of mismanaged dump trucks. As I said, it wasn't my job and I couldn't do a thing, but it sure impressed me with the importance of handling excavating with precision. — *Geo. L. Banks.*

Road Building Absorbs Small Part of Motoring Cost

When the motorist-taxpayer reads that his state is spending millions of dollars for road improvements he may feel that the expenditure is ample. However, the money that is actually devoted to road betterment is but a small percentage of the total motoring cost. Taking figures compiled for Minnesota, which are exemplary of most other states, the total state and local road bill is but ten per cent of Minnesota's complete motoring expenditure.

Replacements of parts, fuel, lubricants, accessories, financing, new cars and trucks, insurance, and so on, this year cost Minnesota motorists $372,000,000. It is estimated by the State Highway Department that in 1930 Minnesota will spend $38,500,000 for roads. It is prophesied that the total motoring bill for 1930 will be $390,000,000. Consequently, the license and gasoline tax moneys which go into the trunk highway fund will be less than 5 per cent of the total motoring bill.

C. M Babcock, Minnesota's Commissioner of Highways, recently declared: "Although our total motor bill is increasing, the cost per vehicle mile is decreasing. This is partly due to improvements in the cars, but mostly due to improved highways. With further improvements in our highway system, we can still further reduce the cost per car mile. Every dollar spent for better roads will save several dollars for gasoline, tires and repairs." —*E. E. Duffy.*

A gentleman pretty well perfumed picked up the telephone.

"Hello, hic, hello."

"Hello," returned the operator.

"Hello."

"Hello."

"My gosh," said the gentleman, "how this thing echoes!"

EQUIPMENT YOU OUGHT TO KNOW ABOUT

New 2¼-yard Diesel Excavator Announced by Bucyrus-Erie Company

Recently introduced by *Bucyrus-Erie Company* is the new 52-B Diesel shovel, dragline, clamshell, crane, which they claim is "the fastest 2¼-yard Diesel ever built." Particularly welcomed by dragline men are the new extra long and extra wide caterpillar-type mountings provided instead of regular mountings when low ground-bearing pressure is required. Complete steering control from the operator's position and independent propelling, permitting swinging, hoisting and propelling at the same time, are additional features for easier and faster mobility. The power plant is an Atlas-Bucyrus-Erie improved, four-cycle, six-cylinder, solid injection, full Diesel, giving great fuel economy with the Diesel's well-known characteristics of increased lugging power under load. The new machine conforms to the latest standards of mechanical perfection, having all high-speed shafts mounted on ball or roller bearings, transmission and swing-reversing gears and all gears below deck inclosed and running in oil, rugged unit steel-casting construction, and many other refinements in design. The machine is built for shipment on a flat car without removing the revolving frame and cab from the base.

For further particulars regarding this latest addition to the "complete line" of the world's largest builder of excavating equipment, write *Bucyrus-Erie Company, South Milwaukee, Wisconsin,* or your nearest Bucyrus-Erie dealer mentioning *The Excavating Engineer.*

Gelamite Explosive Described

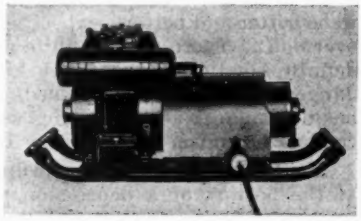
A new type of explosive being manufactured by the *Hercules Powder Company* is described in a booklet "Hercules Gelamite" just issued.

Gelamite, the result of years of research in Hercules laboratories, is an economical substitute for gelatin dynamites up to 60% strength at a saving of 10% to 20% in explosive costs, according to the manufacturers. Its characteristics — water resistance, cohesiveness and plasticity, strength, safety, and suitable fumes — compare favorably with the gelatin grades and can be used more economically. In mines, quarries, open pits, and in construction work, Gelamite has proved its worth in blasting tests.

Weight equivalents for the replacement of Gelatin Extra L. F. and cost per cartridge is included in the booklet which may be secured by writing *Hercules Powder Company, Wilmington, Delaware.*

A New Portable Power Unit

A portable power plant, weighing 120 pounds and capable of delivering 1000 watts, has been developed by the *Westinghouse Electric and Manufacturing Company.* This plant is provided with duralumin skids, which make it easy to transport. It is powered by a gasoline engine developing two horse power at 4000 r.p.m. There is only one exposed moving part. All other parts are enclosed in a sealed bath of oil, protected from dust and dirt. The gasoline tank has a capacity of 2½ quarts, which is sufficient to operate the engine for three hours under full load conditions. The engine speed is controlled by an automatic mechanical governor. Accurate speed adjustment is provided between 1800 and 4000 r.p.m. This portable plant has been designed to meet the needs of construction and repair crews for a convenient and portable source of power. It is ideal for use in the field where power is required for drills, chisels, saws, and similar tools. This unit is described in detail in Leaflet 20469, and is obtainable by writing *Westinghouse Electric and Manufacturing Company, Advertising Department, East Pittsburgh, Pennsylvania.* Please mention *The Excavating Engineer.*



New Light-Weight Paving Breaker

A 38-pound paving breaker designed to meet the need for a demolition tool that is easy to handle is now being produced by *Ingersoll-Rand Co.* This new tool, the L-54, is 14 pounds lighter than the next largest size, but compares favorably with it in power. For general demolition work it can be easily handled in a horizontal or upward sloping position where heavier tools are difficult or unhandy to use. It is more convenient and safer to use on scaffolding than larger sizes. It is effective as a spike driver, and will put down a large railroad spike in 4 seconds. This new tool uses 1-inch hexagonal steel with a collared shank. For further information write *Ingersoll-Rand Company, 11 Broadway, New York City,* mentioning this magazine.

The Excavating Engineer

A Monthly Publication Devoted to Excavating and Allied Subjects

REGULAR SUBSCRIPTION: $1.00 a year for 12 months.
SPECIAL SUBSCRIPTION: Upon application on card inserted in this number, subscriber's name will be placed on Rotating List, whereby he will receive The Excavating Engineer frequently (not regularly) free of charge.

THE EXCAVATING ENGINEER PUBLISHING CO.
F. O. Wyse, Manager-Editor Arnold Andrews, Associate Editor
South Milwaukee, Wisconsin
Printed in U. S. A.

The Business Situation

IT is interesting today to look back about 14 or 15 months—to the beginning of the second half of 1929, the top of the so-called "bull market," the period when everyone was optimistic and expecting business to be better and better—expecting to make his fortune overnight. There were definite statistical signs then, definite conditions that were known and that were danger signals for the immediate future. But the business man was optimistic, we were carried on a crest of optimism generated by the months just past.

Today the pendulum has swung, we are apparently at the bottom of a depression with several months history of declining prices, decreasing business activity and falling security prices immediately behind us. Our reasoning is affected by the pessimism generated in the past few months. It is almost impossible for the business man to sit back, studying the statistical evidences of the times and arrive at a forecast of the immediate future based on sense instead of sensitivity.

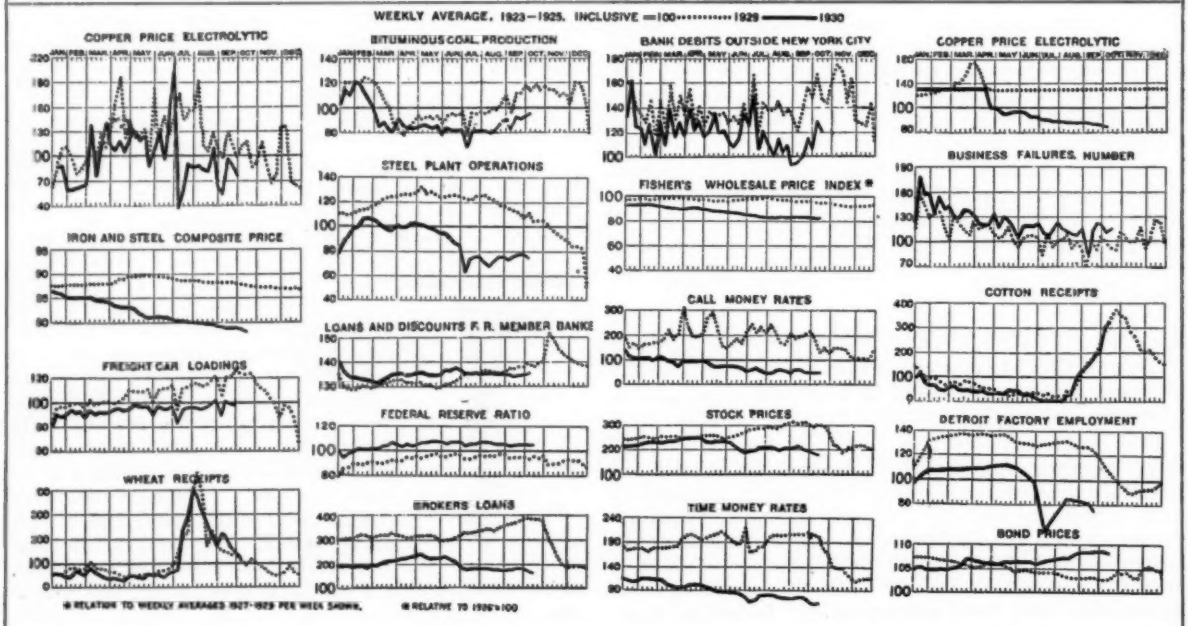
One of the signs of the end of the "bull market" was the terrific orgy of optimism that immediately preceded the crash last Fall. One of the signs of the end of a "bear market" is always a doleful surge of pessimism that sweeps the country and sees no ray of hope.

It is impossible to say definitely that there will be no further declines before there sets in a long, steady swing of improvement in business that will run for several years, but at the moment almost every factor indicates that the worst is over.

If we go to history, we find that, of the five major depressions experienced by this country in the past thirty years, in two of them the time between the beginning of the decline and the bottom of the depression was twelve months and in two others ten and fifteen months; the present depression has lasted fourteen months so far—another factor suggesting the end of the decline.

And there are other signs today that point definitely to the end of the bear market. There are many evidences of a halt in the fall of commodity prices. Inventories in most lines have been reduced to a point close to the minimum. Money is exceptionally cheap and ample funds available. Residential building has, in the last few weeks, shown a very decided increase, and it is interesting to note that this particular phase of building activity gave us some two years' warning of the beginning of the present depression. After the war, residential building was very low. During the depression of 1921 residential building took a new lease on life, and the active period of resident construction continued through 1928. At this point, apparently, the high cost of construction reduced the number of homes being built, and the figure dropped off severely in 1929 and 1930. Today

WEEKLY BUSINESS INDICATORS



declining prices have awakened, in many a mind, the thought that "now is the time to take advantage of comparatively low costs and build our home." An increase in residential construction affects numerous other lines of business activity, and should eventually lead to improved business all along the scale.

New York contractors speed drill sharpening with centrally located shop

(Continued from page 533.)

Many blacksmiths forget that the shank of a modern hammer drill steel is almost as important as the bit itself. Such a shank receives anywhere from 1000 to 2000 sharp blows per minute, and must be kept smooth, true, and square with the steel. It must also be properly oil tempered so that it will not chip or batter. The length of the shank to the lug must also be kept within definite limits so that the drill will not short-stroke or strike the fronthead. Using a central shop which can be equipped with an air-operated pedestal grinder, it is a matter of but a few moments to true up a drill shank when it starts to wear down to any appreciable extent. In this way, a shank can frequently be restored to perfect condition without even being heated.

Poirier & McLane, apparently have considered all of these factors, and, in addition, have found that with one fast, light truck it is not difficult to collect dull steels and deliver the sharpened lots to the various jobs. The nature of the rock on any particular job is quickly determined, and it is an easy matter to closely figure the number of sharp steels required over any given period. There need be no waiting for steel, and delays are eliminated. Any contractor knows how often such delays occur when the blacksmith shop is located right on the job.

With a centrally located shop, a little larger initial supply of steel may be required, but this has its advantage in that the steel is allowed more time to rest between periods of use. This additional time is generally thought by metallurgists to definitely increase the life of steel, as it allows the molecular structure more time to readjust itself.

Originally the shop of Poirier & McLane was intended to take in some outside work, but the company's operations have grown rapidly. They have recently installed additional portable air compressors, and the shop is now kept running at full capacity on the company's own drill steel. No detailed figures are available, but it is estimated that the cost per bit sharpened is approximately two-thirds of what it would be if the steel were handled in individual shops.

Irrigating the Plains of Urgel

(Continued from page 531.)

mented gravel and conglomerate. At first sight it would appear to be impossible to do this work with draglines, yet the Bucyrus-Erie E-2 Diesel draglines have proved that it is perfectly possible to carry this out on a reasonably economical basis, the worst portions of the rock, of course, being blasted.

Diesel Operation Has Proven Very Economical

The material differs so much that, of course, the outputs obtainable from the machines vary enormously, but taking the average over a year's work-

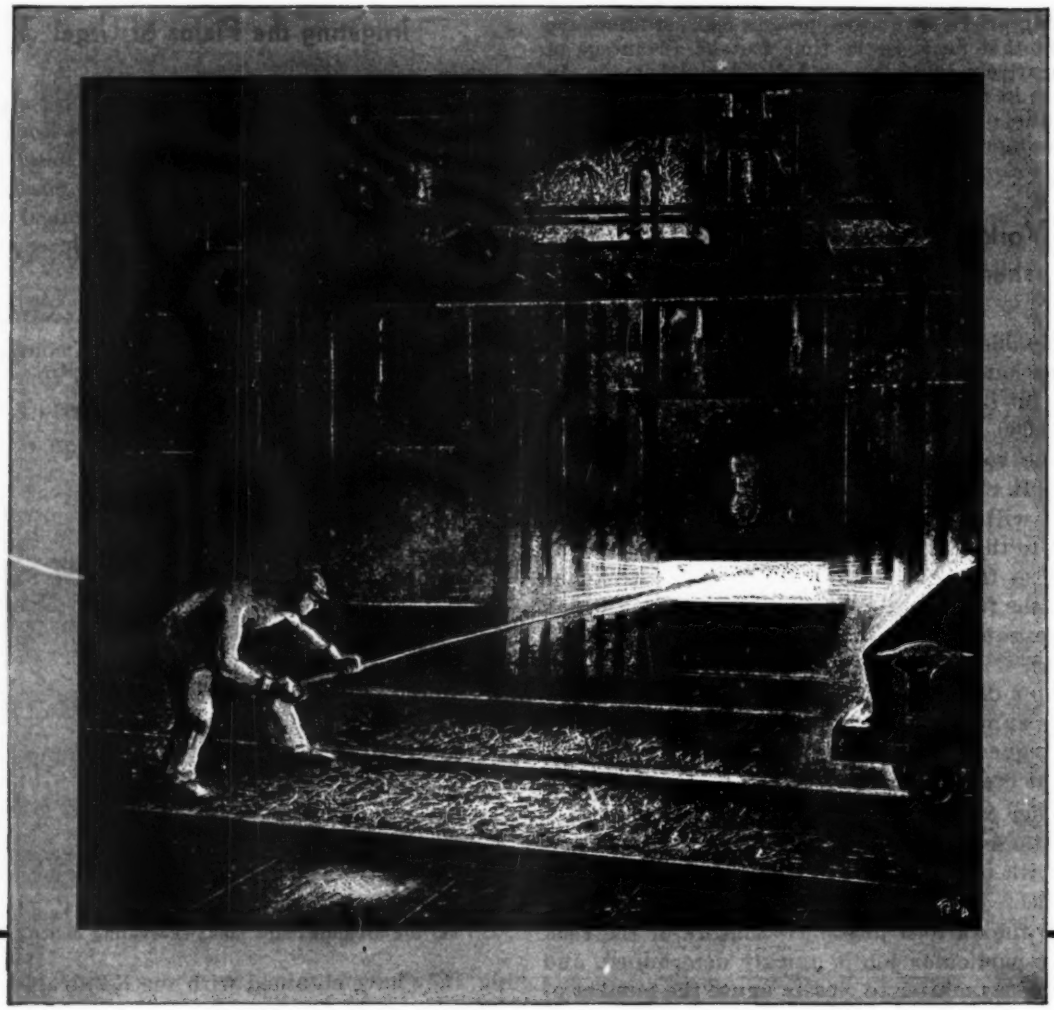
The pile of rocks accumulating on top of the bank in front of the dragline helps make excavating difficult.

ing, they have obtained with the E-2 draglines an average output per machine of 400 cubic metres (52.3 cubic yards) in 9 hours. The machines have been exceedingly economical, burning only 70 liters of fuel oil (18½ gallons) in 9 hours and using 4 kilogrammes (8.8 pounds) of lubricating oil and ¼ kilogramme (slightly over ½ pound) of Voco cup grease.

The accompanying illustrations show the kind of work which is being done, and the large boulders of rock piled up around the caterpillars will be noticed.

Our Front Cover

The St. Louis University Football Team desired to play their first game at night on Friday, September 26th. There was a rush order put through to The Gamble Construction Company who had the construction contract. The St. Louis Steel Erection Company was called in to set the steel towers to carry the floodlights. Their Bucyrus-Erie steam crane was on the job Tuesday morning. The steel was all in place at quitting time Thursday. In the game Friday night St. Louis trimmed Cornell College to the tune of 27 to 0 beneath the brilliant lighting that turned night into day. Incidentally 7500 fans enjoyed the game and will come again.

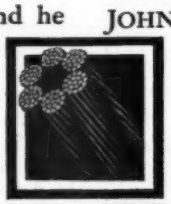


Cooking the *"broth"* this way costs more ... *but see the results!*

CAREFULLY the "cooks" tend their cauldrons of seething metal. One scans his "broth" with practiced eye... and adds more of this, or of that. Another dips a sample for testing. Each bubbling potful is painstakingly watched, "seasoned", tested ... clear through to the final pouring.

Talk to a Roebling steel man and he will tell you that this exceptionally close control of the melt is made possible through using only *small* open-hearth furnaces. That making steel this way costs more... but a consistently higher grade, unvarying product results. It is this *old-fashioned thoroughness*... coupled with modern production methods... that makes Roebling "Blue Center" Steel Wire Rope what it is!

JOHN A. ROEBLING'S SONS COMPANY
WIRE • WIRE ROPE • WELDING WIRE • FLAT WIRE
COPPER AND INSULATED WIRES AND CABLES
TRENTON, N. J. *Branches in Principal Cities*



ROEBLING WIRE ROPE

In writing to John A. Roebling's Sons Co. please use post card bound in the center of this number.

SHOTS FROM THE FIRING LINE

Construction of Hoover Dam "Will Proceed with All Possible Expedition"

Secretary Wilbur, of the Department of the Interior, announced October 13th, that the Comptroller General of the United States had declined the request of the State of Arizona that approval be withheld on the use of funds for the construction of Hoover Dam. Construction of the 582-foot dam at Black Canyon, dedicated by Secretary Wilbur as the Hoover Dam on September 17, will proceed with all possible expedition. Construction of the railroad which will convey supplies to the dam site is already under way, and specifications for the diversion tunnels and the dam itself are in the course of preparation by the Bureau of Reclamation.

Under the power contracts executed by the Department of the Interior for the sale of power to the City of Los Angeles, the Metropolitan Water District of Southern California, and the Southern California Edison Company, 663,000 primary horsepower will be taken and paid for each year by these three contractors, with the Secretary reserving the right to reallocate 36 per cent of this power to the States of Arizona and Nevada whenever they demand it, and six per cent to the eleven smaller municipalities of Southern California. Over a fifty-year period, if the initial rate of 1.63 mills per kilowatt-hour for use of the falling water is maintained, the Government will receive $209,000,000 and $360,000,000, giving ample margin for repayment of the cost of the dam, and payments of 37½ per cent of the excess to the States of Arizona and Nevada in lieu of taxes, with liberal payments into the Colorado Dam fund for construction work on the river to benefit the other States which border upon it.

International Road Congress Meets in Washington

The sixth International Road Congress, with which was held, under the auspices of the American Road Builders Association, the International Exposition and Demonstration of Road Construction and Maintenance Equipment and Materials, took place in Washington, D. C., October 6th to 10th. The Washington Auditorium was the scene of the exhibits, and with the demonstration field at Rock Creek and Potomac Parkway, visitors had an ideal opportunity to learn the latest highway building and maintenance methods.

Over 600 visitors from foreign countries made the trip to the United States for the Congress and Exposition. Among the exhibitors were: Allis-Chalmers Mfg. Co., Monarch Tractors Division, Springfield, Illinois; Blaw-Knox Company, Pittsburgh, Pennsylvania; Bucyrus-Erie Company, South Milwaukee, Wisconsin; Caterpillar Tractor Co., Peoria, Illinois; and the Kohler Company of Kohler, Wisconsin.

National Sand and Gravel Association Convention for St. Louis in January

The National Sand and Gravel Association report plans well under way for making the 1931 convention, which will be held in St. Louis, Missouri, January 27th, 28th and 29th, 1931, the best ever held. For the first time, the American Road Builders Association, the National Sand and Gravel Association, and the National Crushed Stone Association, will hold their conventions in the same city within a space of about three weeks' time, permitting visitors and exhibitors to attend one or more of these conventions without cost of covering additional mileage. Railroads have co-operated by granting a 30-day time limit on the regular convention fare rate.

Accidents in Quarrying Industry During 1929 Show Increase Over 1928

A statistical survey of the quarrying industry in the country during the calendar year 1929, made by the United States Bureau of Mines, Department of Commerce, showed that 126 men were killed and 9810 were injured in this branch of mineral industry. The death rate, for men employed both in and about the quarry and at outside works, was 1.65 per thousand 300-day workers, which was an increase of 13 per cent over 1928 when 119 men were killed. The injury rate of 128.14 decreased one per cent from the 1928 figure, which was based on 10,568 injuries.

Accidents and fatalities occurring among the 85,561 men employed in quarries of various types are, with rates per thousand 300-day workers, as follows:

	Total men employed	Fatalities	Rate per 1000 men	Injuries	Rate per 1000 men
Limestone quarries	36,134	58	1.87	5,315	171.46
Cement-rock workers....	20,687	26	1.20	944	43.48
Granite quarries.....	11,195	23	2.49	1,515	163.85
Marble quarries.....	6,658	5	0.79	609	95.62
Sandstone and bluestone.	3,736	1	0.39	343	134.99
Trap rock quarries.....	3,599	11	4.07	592	218.93
Slate quarries.....	3,552	2	0.67	492	164.55

Since the number of days that quarry employees actually work varies from year to year and from state to state, the hazards of their occupation are not the same, and accident rates based on the average number of employees as actually reported would not be comparable. By reducing the number to its equivalent of 300-day workers, the accident rates indicate more accurately the liability to accidents to which the employee is exposed.

Of the 126 deaths in the entire industry, 78 occurred in the quarries and 48 at outside works, while 6,173 injuries were caused by operations inside the quarries and the remaining 3,637 occurred on the outside.

The principal causes of death and accidents are found to be, inside the quarries, falls or slides of rock or overburden, explosives, and machinery, boiler and air-tank explosions. In outside works haulage was responsible for the most fatalities, with machinery and falling objects next in the order of mention. Handling rock at face was responsible for 24 per cent of the injuries inside the quarries, and the greatest contributing factor to injuries at outside works was flying objects.

New England Notes

BY G. R. ENGLAND

The accompanying illustration shows **T. J. Connor's** Bucyrus-Erie 1035 drag shovel starting the trench for sewer at the new Fairview State Hospital job at Newton, Connecticut. The new building will cost in the vicinity of $10,000,000, and excavating and preliminary work requires 200,000 cubic yards of excavation. Mr. Connor is a well-known Bridgeport contractor.

New York Notes

BY G. R. ENGLAND

In the back yard of the plant of the **General Electric Company**, their Bucyrus-Erie 1020 was used to excavate a basement 80 feet x 80 feet.

The job was quite difficult, as a high-powered electric line which ran through the center of the basement could not be disturbed, making it necessary for the 1020 to dig one-half of

Style B Patent Flattened Strand

"HERCULES" RED-STRAND

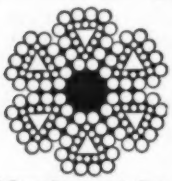
REG. U.S. PAT. OFF.

WIRE ROPE

Has Many Exclusive Points of Advantage

This wire rope is the combination of extra high grade material with a construction that provides specific advantages unequalled by any other type of wire rope manufactured.

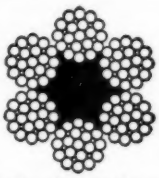
Some of the chief features of this construction are: (1) Grade for grade it is stronger than any Round Strand construction, which is a big advantage under many of the present-day working conditions. (2) The keystone shape of each strand and the small hemp center offer greater resistance to crushing. (3) The outer wires in each strand conform to a circle, consequently surface wear is distributed over a greater number of wires. This smooth outer surface also reduces wear in grooves of drums and sheaves. (4) This rope gives a higher factor of safety, not only because of its greater strength, but also because its flatter surface between the strands themselves minimizes the danger of the strands cutting each other.



A Cross Section of a Genuine Style B Patent Flattened Strand Wire Rope

Style B Patent Flattened Strand Wire Rope is made up of 6 strands of 25 wires each, but all 6x25 wire ropes are not of the genuine Patent Flattened Strand construction. Some 6x19 Round Strand ropes, in addition to the usual 19 wires, also have 6 small "filler" wires in each strand to make it more compact. These "filler" wires, however, do not increase the rope's strength.

When you are offered 6x25 wire rope, it will pay you to find out whether it is a "filler wire" construction or the genuine Patent Flattened Strand construction. We particularly recommend Style B Patent Flattened Strand "HERCULES" (Red-Strand) Wire Rope for use on heavy duty cranes, clam shell buckets, dredges, excavators, mine hoists and shovels.



A Cross Section of a 6x19 Round Strand Wire Rope Filler Wire Construction

If you are not entirely satisfied with the amount of service you are now getting for each wire rope dollar that you spend, we would like to have you give this remarkable wire rope a chance to show you what it can do.

Made Only by **A. LESCHEN & SONS ROPE CO.** Established 1857

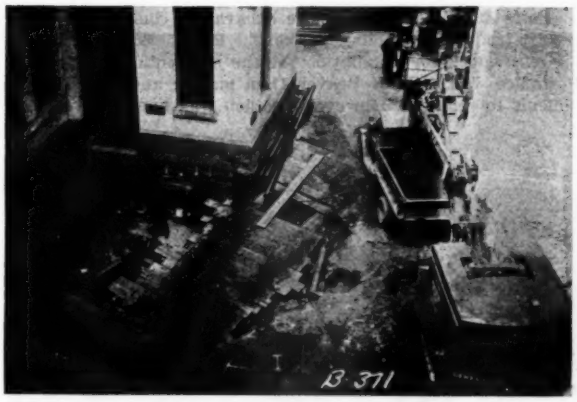
5909 Kennerly Avenue

ST. LOUIS

New York **Chicago** **Denver** **San Francisco**

For your convenience in writing A. Leschen & Sons Rope Co. you will find a card bound in this issue.

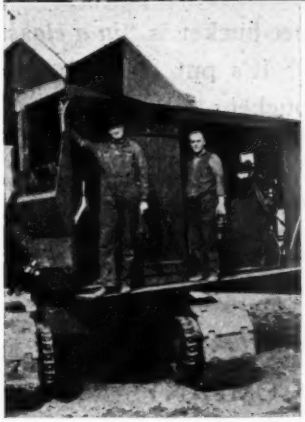
SHOTS FROM THE FIRING LINE — Continued



the basement and then carefully the other half. Another obstacle was the material — soft and of a quicksand nature. In the corner, at the left of the ramp, the machine broke through and leaned against a wall at a 30-degree angle.

Nevertheless, the 1020 handled this job in an excellent way, and has won a notch for credible achievement.

Through the courtesy of **Lester Davies of Bronx, New York,** who is operating a Bucyrus-Erie GA-2 clamshell-crane



with 50-foot boom and 1¼-yard bucket for the **Colonial Sand & Stone Company,** we have received the above illustrations. The upper view shows the GA-2 with full bucket (note the low boom), and the lower view shows Operator Davis and his pitman. The Colonial Sand & Stone Company have two of these Bucyrus-Erie GA-2's, each of which, says Operator Davies, can handle a thousand yards in ten hours.

Buffalo and Vicinity

BY D. E. WHITE

Lewis County's 1020 Bucyrus-Erie machine has been working every day since its installation under the able supervision of County Superintendent **L. P. M. Gaylord,** who has had this machine do some very heavy and hard digging. Superintendent Gaylord is more than surprised at the yardage this machine turned out. **Elan Recor** has been operating this 1020 most of the time and has certainly kept his machine up in great shape.

E. Dalrymple & Sons of Elmira have been very busy all summer in and around Elmira, digging basements and stripping their gravel pit. Both Ed and Hank are taking turns about operating their 1035 Bucyrus-Erie and their Keystone shovel, and are actually getting fat on the job. We certainly hope good conditions around Elmira continue.

Charles French of Brewerton, New York, who has been ill for the past year and a half, has finally reported himself fit for duty. Charlie, by the way, has operated a standard-gauge railroad type shovel as well as Whirleys and Bucyrus-Erie Gas + Air machines and is now looking for a job.

Utica Construction Company of Utica, has completed its excavation on the State Highway project out of Middleburg, New York, and expects to move their shovels into Utica in the next two weeks. **Johnny Hines** has been operating their Bucyrus-Erie 1030, and **Al Johnson** has been slinging the dirt for their Bucyrus-Erie Gas + Air. **Jack Cronin,** "the old Turk," was in charge of this work.

This season **Ontario County** has completed a considerable number of lines of county road work, as well as having made several creek channel changes. **Erwin Morenda** is pushing the levers on their machine and states he likes it better each day he operates.

Mr. Kellogg, the County Superintendent of Ontario County, took a very active part in the County Highway Superintendent's Convention, recently held at Niagara Falls, New York, as did several of his Supervisors.

Walt Bowen, County Superintendent of Cattaraugus County, managed to break away from his many activities to attend the County Superintendent's Convention at Niagara Falls, and I, for one, can vouch that Walt had a good time.

The **Steuben County** Bucyrus-Erie 1020 has been working continuously all summer under the supervision of **County Superintendent Kellogg,** who is more than pleased with the work turned out by this machine. **Cliff Stinson,** at the levers, has operated several different types of one-half yard machines and he stated that he believed the 1020 the fastest machine of its size in the field today.

Mack Construction Company has a State Road job up out of Greenwich, New York, and is surely making the dirt fly, using a Lorain 75 and Bucyrus-Erie Gas + Air. **Bruce Donald** is at the levers of the Gas + Air. Bruce has the wife and family up there with him. He wishes to be remembered to all his old friends.

New Jersey Notes

At the Springtown plant of the **Trimmer Sand and Gravel Company** of Middle Valley, the Bucyrus-Erie Gas + Air at the left recently celebrated its fourth birthday. There wasn't any cake but the GA-2 waded into a bank of gravel as though it were good eating just the same.

SHOTS FROM THE FIRING LINE — Continued

Quaker Notes

BY M. G. CONWAY

J. S. McCandless of Mountain City, Tennessee, is grading six miles of the Lee Highway west from Warrenton, Virginia. Mr. Candless says that Lloyd Bhilyow on the Gas + Air shovel got an estimate of twenty-six thousand yards for the month of June. They worked twelve hours per day.

Ex-Farmer with a Reputation

Ex-Farmer to Mike (Walking Boss): "I want me a job of work. I be from I-O-ee, I be."

Mike (mimicking): "Oh, be you from I-O-ee?"

Ex-Farmer (encouraged): "Umhm."

Mike: "Well then get a hold of that wheelbarrow you $c|*(;*?!)—, and see how much dirt you can move.

— Submitted by W. S. R.

Baltimore Notes

BY F. J. FAIMANN

Potts & Callahan, Baltimore excavating contractors, have the contract for demolishing the old Postoffice Building and for excavating for foundation for the new building. The old Postoffice was built of Beaver Dam marble and proved very difficult to remove. However, the job was handled with the

customary skill that has made a name for this firm in the East. The Bucyrus-Erie Type A steam shovel equipped with clamshell boom as shown above was used for digging pier holes and cleaning up the corners of the excavation. The total amount of the contract including the erection of the new six-story building is about $3,000,000. **N. P. Severin Company** of Chicago, Illinois, is the General Contractor.

Get the *most powerful* bucket built - - the new WILLIAMS "Champion"

USERS tell you that this super-bucket is *"in a class by itself for hard digging."* It's put on your job guaranteed to outdig any other bucket.

The new WILLIAMS "Champion" challenges competition, and invites comparative tests. Try it on your work—make any tests you want. It sells itself by *better performance.*

G. H. WILLIAMS COMPANY
603 Haybarger Lane, Erie, Pa.
Branch Offices: New York, Pittsburgh, Chicago

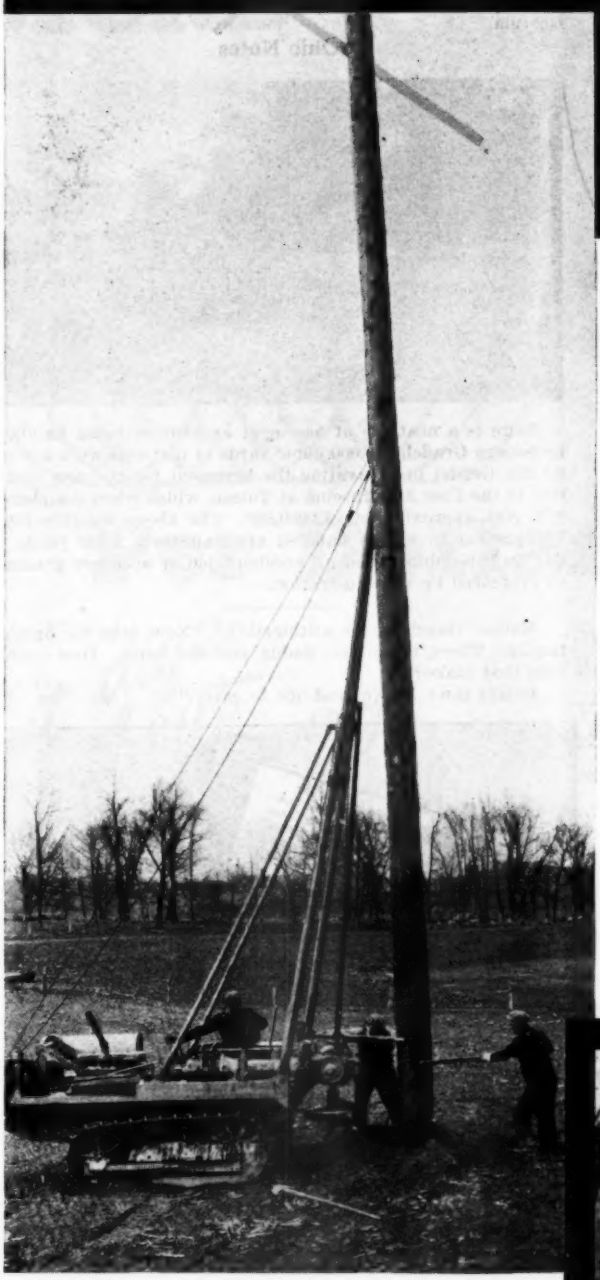
21 IMPROVEMENTS, including easy-filling scoops, designed with the scientifically correct "Line of Least Resistance"—no rivets to catch material—all welded. New Power and Speed.

WILLIAMS
BUCKETS—TRAILERS

239

For your convenience in writing G. H. Williams Company you will find a card bound in this issue.

TO EVERY POWER AND TELEPHONE COMPANY



HERE is the modern way of erecting poles—a "Caterpillar" Thirty equipped with a post-hole digger—able to haul poles 'cross country—able to erect them in the proper place with the help of two men—able to work in all kinds of weather.

Ask for further information if you are interested in the economy of using this "Caterpillar" Tractor and post-hole digger.

Prices—f. o. b. Peoria, Illinois

TEN	$1100	TWENTY	$1900
FIFTEEN	$1450	THIRTY	$2375
SIXTY	$4175		

Caterpillar Tractor Co.

PEORIA, ILL. *and* SAN LEANDRO, CALIF., U. S. A.
Track-type Tractors Combines Road Machinery
(There's a "Caterpillar" Dealer Near You)

CATERPILLAR
REG. U. S. PAT. OFF.
TRACTOR

One view shows a "Caterpillar" Thirty on the operations of the Northern States Power Co., in Minnesota—the smaller view shows another job with a "Caterpillar" Fifteen near Chicago. Men with shovels enlarge the rim of the hole to take a sand bag used in the blasting operations. These holes are later expanded at the bottom by an explosive—then filled with concrete for an anchor.

For your convenience in writing Caterpillar Tractor Co. you will find a card bound in this issue.

TEAM WORK

AMONG STRANDS MEANS LONGER LIFE IN WIRE ROPE . . .

Longer life with Tru-Lay Preformed Wire Rope is more than an advertising claim. Hundreds of bona-fide test reports from users of Tru-Lay prove that 30% to 300% increased service is obtained over ordinary wire rope.

Take for instance the experience of a large New York Company operating a 1½-yard Osgood Shovel, digging in solid blue rock, on the New York Subway Construction. Tru-Lay gave 200% increased service—3 weeks double shift, as against a maximum of 1 week double shift with ordinary wire rope.

Discarded Tru-Lay ropes were then used for Fordson Tractors, because Tru-Lay Preformed Rope resists kinking.

Because of Tru-Lay flexibility and ease of handling, accidents were eliminated — with ordinary wire rope workmen crushed their fingers in reeving new ropes on equipment.

This is a demonstration of perfect team work among strands. Note how a strand can be unwound from the cable, and a wire from the strand. Both fit back into position. Note also that it is not necessary to seize the end of Tru-Lay Preformed Wire Rope.

Let us give you complete information. Mail a card or letter, telling us the type of equipment. Address:

AMERICAN CABLE COMPANY, *Inc.*
New York Central Bldg., 230 Park Ave., New York, N.Y.
An Associate Company of the American Chain Company, *Inc.*

District Offices:
Chicago, Detroit, Philadelphia, Pittsburgh, Tulsa, San Francisco
Canadian Licensed Manufacturers:
Dominion Wire Rope Company, *Limited*, Montreal; Canada Wire & Cable Company, *Limited*, Toronto
Anglo-Canadian Wire Rope Company, *Limited*, Montreal

PREFORMED WIRE ROPE
TRU-LAY
REG. U.S. PAT. OFF.

SHOTS FROM THE FIRING LINE — Continued

Southern Notes

Curry & Turner, Bradenton, Florida, have made arrangements to start their grading and surfacing job in South Georgia.

Ohio Notes

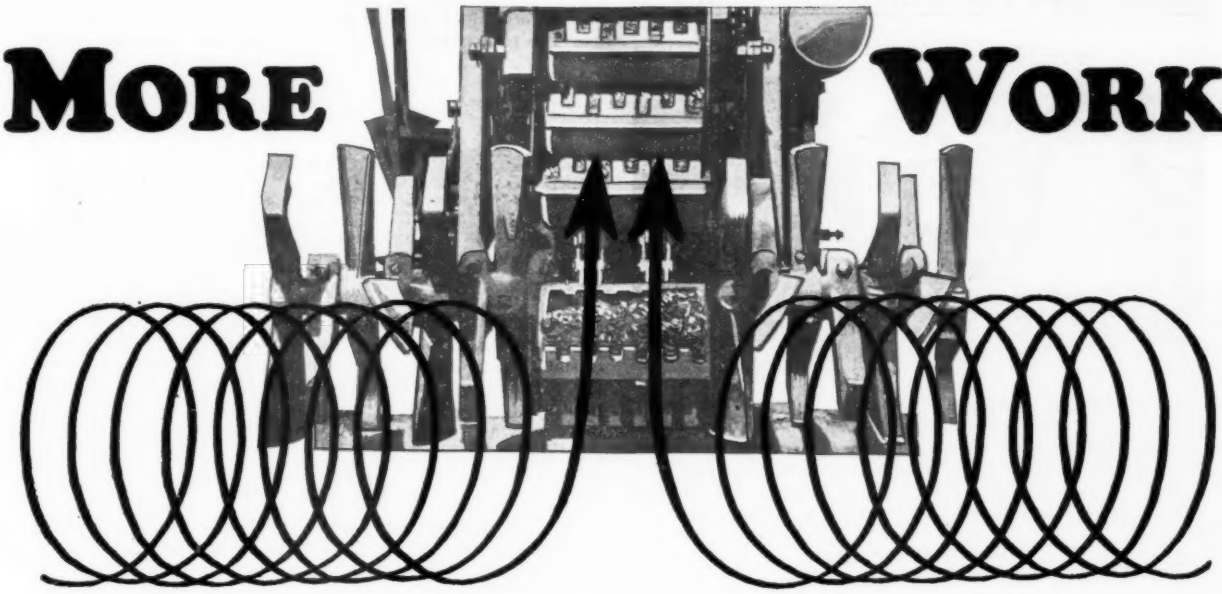
Here is a neat job of basement excavation being handled by **George Gradel.** 40,000 cubic yards of material were moved by Mr. Gradel in excavating the basement for the new addition to the Free Art Museum at Toledo, which when completed will cost approximately $2,000,000. The above Bucyrus-Erie B-2 loading to trucks handled approximately 1,000 yards a day on this job and did an excellent job of accurate grading as evidenced by the illustration.

Mother (teaching son arithmetic): "Now, take the Spinks family. There is mother, daddy and the baby. How many does that make?"

Bright son: "Two, and one to carry."

LIBERAL BONUS—For contractors, a liberal bonus in the form of excavating economies is earned by Hayward Buckets. Address the Hayward Company, 52-54 Church St., New York, N. Y.
Hayward Buckets

MORE WORK



Per Dollar Invested

"it digs without plowing"

Shallow grading at the lowest cost per yard! Why think of spending half as much again—when a Haiss Excavator will take out up to 2 yards per minute and handle any light excavation up to a 4-ft. cut? The machine will save you money in good years or bad years—but now's a time to make every dollar count. Investigate the Excavator! Clip the coupon, right NOW.

_____ 193

George Haiss Manufacturing Co., Inc.
144th St. and Park Ave., New York.

Please send me a copy of your Catalog picturing the EXCAVATOR—and the work it has been doing.

Name _____

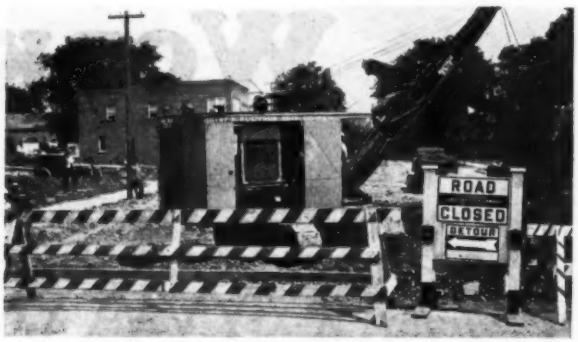
Address _____

HAISS EXCAVATOR

Also Builders of PORTABLE BELT CONVEYORS, CLAMSHELL BUCKETS, ELEVATORS, SCREENS, etc.

In writing to Geo. Haiss Mfg. Co., Inc., please use post card bound in the center of this number.

SHOTS FROM THE FIRING LINE — Continued



H. F. Beckler of Athens is using his Bucyrus-Erie Gas + Air for street work at McArthur, Ohio. It will be remembered that Mr. Beckler built the stadium for Ohio State University. Note the nifty detour signs used in Ohio. Some of the other states we have traveled through this summer might adopt these neat and easily-read signs to good advantage.

Chicago and Vicinity

BY L. E. MAC DONALD

The orders were rush when the contract was placed for excavating the basement for the new Lane High School at Chicago, which is located at the corners of Addison and Western just north of Riverview Park. This big new high school, which will be about 600 feet square, required the excavation of about 100,000 cubic yards. **General Contractor, William O'Neil,** therefore, signed up as subcontractors: **The Gerlack Company** with their Bucyrus-Erie Gas + Air, **T. M. White Company** with their Bucyrus-Erie Type-B and **Harry Bairstow** with his McMylers steamer. In addition it was arranged for the Great Lakes Dredge and Dock Company to move in two of their Bucyrus-Erie 50-B steamers for pile-driving service. The photograph reproduced on this page shows the entire

operation as it looked early in August. In the right foreground is Mr. White's Type-B, in the middle foreground the Gerlack Gas + Air is piling the dirt into the Mack trucks, at the extreme left is Mr. Bairstow's McMylers, and just behind and to the right of this the long leads of the 50-B pile drivers owned by the Great Lakes Dredge and Dock Company cut into the sky.

We'll Bet It Worked

Here is a California rancher's very effective notice:

"Trespassers will be persekuted to the full extent of 2 mean mongrel dogs, which ain't never been ovarly soshibil with strangers, and 1 dubbled barelt shotgun, which ain't loaded with no sofypillers. Dam if I ain't tired of this hel raisin' on my property."

Iowa Notes

James C. Blunk, contractor of Ottumwa, Iowa, has recently completed an 85,000-yard paving project near Ottumwa. For unloading cars at Blunkville, he used his Bucyrus-Erie 1030 clamshell. D. J. Blunk was superintendent and Harry Dale had charge of the machine.

Here is a 6-yard Page Levee Bucket that loads in 7 seconds. Like all Page Levee Buckets it loads full.
Hold a watch on your bucket—for if you save 6 seconds in loading a 6-yard bucket, you save 10% of your time.

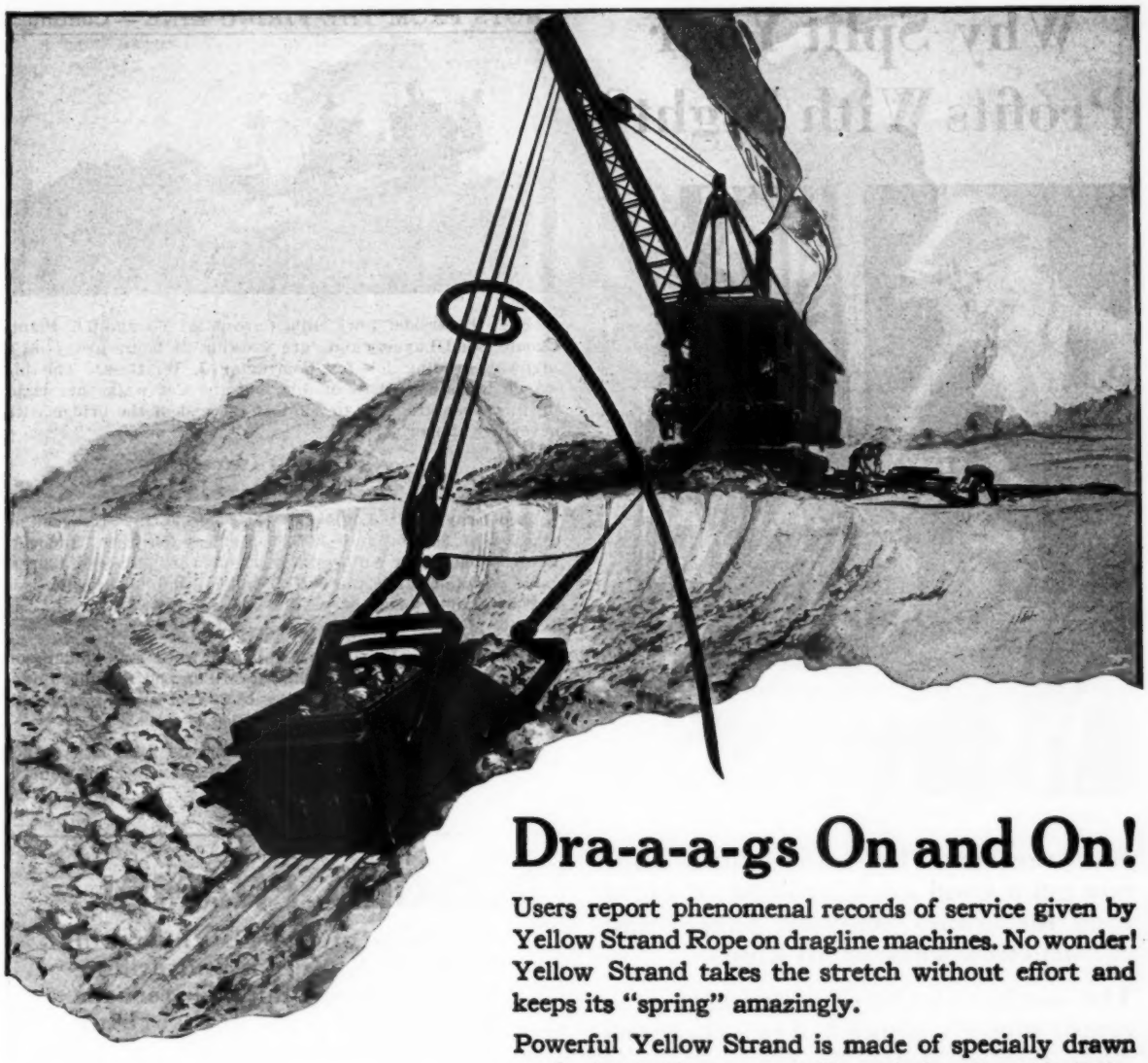
PAGE ENGINEERING CO. Clearing P. O. CHICAGO ~ ILL.

DRAG SHOVELS—DRAG LINES—BUCKETS—SLACK LINES—DIESEL ENGINES

EASTON CARS

FOR EVERY PIT, MINE AND QUARRY

Easton Car and Construction Company
Easton, Penna.



Builders of the famous B. & B. Aerial Tramways for industrial haulage.

Dra-a-a-gs On and On!

Users report phenomenal records of service given by Yellow Strand Rope on dragline machines. No wonder! Yellow Strand takes the stretch without effort and keeps its "spring" amazingly.

Powerful Yellow Strand is made of specially drawn steel wire, laid up on machines designed and built by Broderick & Bascom exclusively for B. & B. factories. Yellow Strand spells rock-bottom economy.

Write for Catalog 51 and name of nearest distributor of Yellow Strand and good B. & B. Ropes in all standard grades.

BRODERICK & BASCOM ROPE CO.
St. Louis, Mo.
Eastern Office and Warehouse: 68-70-72 Washington St., New York City
Southern Warehouse: Houston, Texas
Western Offices: Seattle and Portland—Factories: St. Louis and Seattle

YELLOW STRAND
WIRE ROPE

LR 783

For your convenience in writing Broderick & Bascom Rope Co. you will find a card bound in this issue.

Why Split Your Profits With Night?

With the Novo Flud-Lite Lighting unit, you get a good working light all night long for cranes, shovels, pavers and construction work of all kinds.

The outfit consists of a standard generator directly connected to a standard Novo Timken Roller Bearing Equipped engine. It is fool-proof and vibrationless in operation — compact in design — and will generate 1,000 watts for eight hours on one gallon of gasoline. Built in sizes ranging from 1¼ to 25 KW. Write for complete details.

NOVO ENGINE COMPANY
222 Porter Street, Lansing, Michigan
Clarence E. Bement, Vice-Pres. and Gen. Mgr.

NOVO
Flud-Lite Lighting Units

SHOTS FROM THE FIRING LINE — Continued

Near Riverside, Iowa, this Caterpillar 60 and La Plant-Choate Road Layer wagon are working 24 hours a day on a highway grading job for **Contractor J. W. Ross.** The big wagon holds 8½ yards of dirt, but the Cat walks her right up this steep grade on to a fill at the end of the bridge with never a whimper.

St. Louis Items

BY A. J. KOENIG

Len Gray of St. Louis was awarded contract for grading 6 miles of 36-foot and 56-foot highway on the Vandover-Denny Road, near Valley Park. The work involves 136,000 cubic yards of earth and 80,775 cubic yards of rock; there is also 389 cubic yards of concrete in culverts. The bid was $114,408.

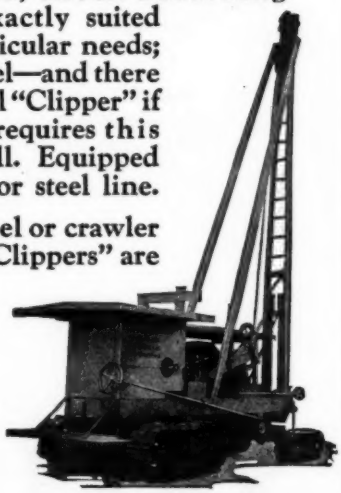
Gaines Bros., Fairland, Oklahoma, were low bidders on six projects of highway grading in Miller and Camden Counties, Missouri, involving 21 miles of 30-foot grading, approximately 500,000 cubic yards, at a price of $319,393.

The Nelson Construction Co., Jerseyville, Illinois, is building 1.23 miles of paving on Route 127, in Montgomery County, Illinois.

RUGGED FRAME!

The frame of your blast hole drill is the backbone of *your* drilling costs. "Loomis Clippers" are made with rugged, shock-absorbing frames — exactly suited to your particular needs; wood or steel—and there is an all-steel "Clipper" if your work requires this type of drill. Equipped for manila or steel line.

Round wheel or crawler mounted, "Clippers" are the proven all-weather drill.

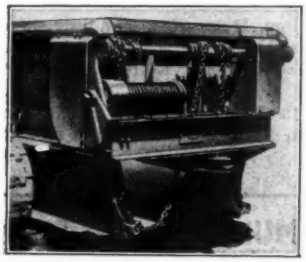


Write for full information.

THE LOOMIS MACHINE COMPANY
(Established 1842)
K Street, TIFFIN, OHIO

The dump boss winding the doors of Western Crawler wagons equipped with spring wind-up. Notice that he trips the lever and the doors close all in one stride.

No Haul Too Short for the Fast Western Spring Wind-Up



The simple mechanism of the Western Spring Wind-Up is mounted entirely on the wagon. No special connections are required on the tractor.

The Western Spring Wind-Up makes the great capacity of Western Crawler wagons available for short haul work. No haul is too short for closing the doors. Your tractor driver pulls the cord or your dump boss moves a lever and, *Bang!* go the doors into place. The same lever or cord dumps the big load.

Equip your Western Crawler wagons, new or old, with this Spring Wind-Up. It is simple; saves time; saves labor; requires no attachment on your tractor.

A Chicago contractor recently made a competitive working test of ALL automatic wind-ups and he installed Western Crawler wagons with Spring Wind-Ups. May we tell you about it? Write for details today.

Western Wheeled Scraper Company
Aurora, Illinois, U. S. A.

WESTERN

THE MEASURE of WIRE-ROPE QUALITY IS THE SERVICE IT HAS RENDERED

Which wire rope to use on your equipment—which brand will give the longest and most economical service—may be best determined by past records of performance established under similar operating conditions. This and the reputation of the maker are of paramount importance.

FOR over half a century American Wire Rope, made exclusively by the American Steel & Wire Company, has demonstrated its superiority—proved beyond question that its tough, flexible and abrasion-resistant nature is the best insurance against breakdowns and costly delays.

Regardless of your particular problem, you will find an American Wire Rope exactly adapted to its economical solution. Consult our nearest branch office or distributor to get the right rope for your purpose.

AMERICAN
STEEL & WIRE COMPANY
WIRE ROPE

AMERICAN STEEL & WIRE COMPANY
SUBSIDIARY UNITED STATES STEEL CORPORATION
208 S. LaSalle St., Chicago 30 Church St., New York

Other Sales Offices: Atlanta Baltimore Birmingham Boston Buffalo Cincinnati Cleveland Dallas Denver Detroit Kansas City Memphis Milwaukee Minneapolis-St. Paul Oklahoma City Philadelphia Pittsburgh Salt Lake City St. Louis Wilkes-Barre Worcester

Pacific Coast Distributors — Columbia Steel Company: San Francisco, Los Angeles, Portland, Seattle, Honolulu.

Export Distributors: United States Steel Products Co., 30 Church St., New York City.

SHOTS FROM THE FIRING LINE — Continued

W. L. Simmons, well-known St. Louis drainage contractor, working on the Lower Salt Creek Drainage District near Mason City, Illinois, uses a Bucyrus-Erie 1035 dragline equipped with 40-foot boom and one-yard Class E Page bucket. Mr. Simmons tells us that he moved 2250 yards, all from one side of the ditch, excavating a 40-foot bottom and leaving a 15-foot berm, in one day (three shifts). He averaged 1900 yards per day for 10 days of 3 shifts each. The above illustration will give you some idea of the type of work on this contract.

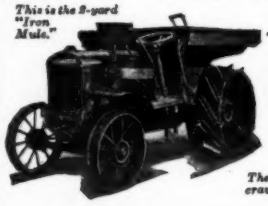
Creake, Thornton & Son, Matoon, Illinois, was awarded contract for paving 7.82 miles on Route 121, Section 108, Cumberland County, Illinois, on their bid of $123,133.

E. W. Kolterman of Hamilton, Missouri, is handling some exceptionally heavy rock excavation on a Missouri State Highway job near Cowgill, Missouri. Mr. Kolterman's Bucyrus-Erie Diesel + Air shovel has been in service both day and night since it moved in the first part of the year. The tractor-drawn wagon seems to have lost the tailgate on one of its recent trips.

Put An "IRON MULE" on the Job

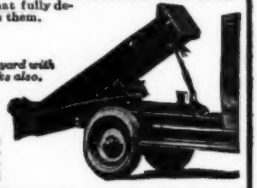
It Licks Trucks and Teams

This is the 2-yard "Iron Mule."



"IRON MULES" for years have made phenomenal profits for dirt-moving contractors. There are 2 sizes — the 4-yard with power hoist dump and crawler tracks, and the 2-yard with gravity dump. These sensational dirt haulers will get where trucks and teams can't go. Write for illustrated broadside that fully describes them.

There's a 4-yard with crawler tracks also.



Dump Bodies Too

HUGHES-KEENAN Dump Bodies for all makes of light trucks are famous wherever dump bodies are used. Made in 1 and 1½ yard sizes, equipped with gravity dump, underbody hand hoist or power hoist. Write for descriptive folder.

THE HUGHES-KEENAN CO. Mansfield, Ohio

Timken Heavy-Duty Mill Type Quad Bearings 29½" Bore, 46½" outside diameter, 29" width. Capacity 7,000,000 pounds.

Timken Bearings *are* Licking *the* Toughest Jobs *in* Industry—Hence *their* Vital Necessity *in* Contractors' Machinery

Sweeping on and up with an irresistible rush, Timken Bearings soar to greater and greater heights of achievement as they are pitted against the toughest jobs that Industry can produce . . . upsetting all pre-conceived ideas of production and production costs . . . revolutionizing anti-friction requirements . . . brushing aside old theories and traditions to make way for new standards of anti-friction efficiency, economy and endurance.

Terrific pressure loads such as are met in steel rolling mill service—as high as 7,000,000 pounds, are being carried by Timken Bearings in many of the country's largest steel plants.

Hair-breadth accuracy such as is demanded by the finest precision machine tool work is maintained as a matter of regular daily routine.

And thrust and speed and weight and shock—no matter how severe, are handled with equal capability and sureness whether encountered in such widely different types of heavy duty service as automobile operation, paper mills, transcontinental limited trains, oil field equipment or any other kind of machinery.

Wherever wheels and shafts turn, "Timken Bearing Equipped" is the modern symbol of protection and saving.

You need and should demand Timken benefits in power shovels, graders, cement mixers, pavers, tractors, hoists and all other equipment you buy. The Timken Roller Bearing Company, Canton, Ohio.

TIMKEN *Tapered Roller* **BEARINGS**

In writing to The Timken Roller Bearing Company please use post card bound in the center of this number.

SHOTS FROM THE FIRING LINE — Continued

J. C. O'Connor & Sons, Ft. Wayne, Indiana, has contract for paving 8.48 miles of highway on Route 104, Sangamon County, Illinois. Their bid on this work was $140,678.

C. G. Blythe & Son of Tama, Iowa, have fifteen teams, tractors and a dragline idle. Looking for a grading job.

Bids for thirty-two road projects were received by the **Missouri State Highway Commission.** 288 bids were submitted by eighty-seven contractors, covering work in nineteen counties, for approximately $1,000,000. The work calls for 75.6 miles of gravel, 13.4 miles of graded earth and 26 bridges. The following contractors were low bidders for grading jobs: Martin Wunderlich, St. Paul, Minnesota, 4.49 miles in Wright County, $71,943; Maxwell Construction Co., Columbus, Kansas, .615 miles in Jasper County, $29,722; Wisconsin Bridge & Iron Co., Milwaukee, Wisconsin, bridge and 30 feet graded earth in Camden County, $179,051; List & Clark Construction Co., Kansas City, Missouri, bridge and 30 feet graded earth in Clay County, $40,067; Bunnell & Mack Construction Co., Paragould, Arkansas, 8.3 miles of 24-foot graded earth in Madison County, $23,339; Wisconsin Bridge & Iron Co., bridge across Meramec River in St. Louis County, $170,468.

Massman Construction Co., Kansas City, Missouri, has contract for 21,460 lineal feet standard pile clump dikes and 5,800 lineal feet revetment, on Missouri River at Wilhoit Bend. Contract price $679,903 and $678,483.

Fruin-Colnon Contracting Co. was awarded contract for Section "B" Mailine Creek Sewer, St. Louis, at a price of $259,186. Riley Contracting Co. was awarded contract for the Bradon Place Public Sewer, Section "A," at $93,068.

The Great Lakes Pipe Line Co. awarded the following contracts: Natural Gas Engineering Co., 180 miles 8-inch gasoline pipe line from Kansas City to Des Moines; Wm. Schmidt, Saukville, Wisconsin, 236 miles of 6-inch line from Des Moines to Minneapolis; Carter Construction Co., Kansas City, Missouri, from Des Moines to Mississippi River; Seybold-Mitchell Construction Co., Houston, Texas, Mississippi River crossing.

The Terminal Railroad Association of St. Louis has applied to the Interstate Commerce Commission for permission to build a new union terminal in East St. Louis, Illinois. This station will be used in connection with the St. Louis Municipal Bridge and will cost about $700,000.

Missouri Notes

BY C. F. BARTON

M. N. Penny Construction Company of Fairfax is using the Bucyrus-Erie 1035 clamshell with Owen bucket shown in the accompanying illustration for unloading stone and sand for one of Missouri's new highways.

HE NEEDS A COFFING HOIST

It's a little fellow with a Big Pull

Either hook can be attached to the load.

Now made in 3 sizes —1500, 3000 and 12,000 pounds capacity. Light weight — easy to operate. You'll find innumerable uses for it around the job.

Write for complete information.

BUCYRUS ERIE

BUCYRUS-ERIE CO.
Specialty Department
South Milwaukee, Wis.

GREDAG
REG. U.S. PAT. OFF.
LUBRICANTS

STOP RUST

Use Gredag No. 16 on machines and parts to be laid up this winter. Cables, gears, chains, pins, etc., will not rust if swabbed with No. 16 before storing. Not merely a rust preventive but primarily a high-grade lubricant.

Bearings now in service and lubricated with Gredag cup grease will be free and ready for use whenever the machines are needed.

ACHESON GRAPHITE CORPORATION
Unit of Union Carbide UCC *and Carbon Corporation*
NIAGARA FALLS, NEW YORK

THE LINN ON GREAT ENGINEERING PROJECTS....

One of a fleet of four Linns purchased by the Phoenix Utility Company for construction work on the Ariel hydro-electric project. The Ariel Dam on Lewis River, Washington, will be 200 feet high and 1,295 feet long. The Linns on this job are equipped with high speed reverse.

WHEN THE GOING IS TOUGH . . . THEY BANK ON THE LINN

Construction work on a mountain dam puts hauling equipment to every test. That's why the contractors chose Linns to move the dirt for the Ariel Dam in the State of Washington.

They have the traction, the power and the stamina to keep going under difficult and severe conditions. The flexible traction grips and keeps going in soft holes or gumbo that would paralyze the operation of a truck. With power to spare, and with a sure-footed traction that grips every inequality of rock surfaces, the Linn surmounts with ease the steepest grades.

On work like the Ariel Dam, time and money is saved by the high speed reverse which enables the Linn to go in and out of one way passes without a turn.

Statistical evidence—certified surveys of Linn cost per ton performance on difficult hauling jobs are yours for the asking. They show the reason for the growing dependence upon Linn in many industries.

Only The Linn Offers You All These Advantages

1. Patented Flexible Traction that grips any surface under all weather conditions.
2. Tremendous hauling power —100 horsepower to take full advantage of Linn Traction.
3. Ten ton capacity on its own chassis.
4. Extra traction and power for additional tow loads.
5. Easy on men—steers like a truck.
6. Four speeds forward with four speeds reverse optional.

LINN MANUFACTURING CORPORATION

Division of LaFRANCE-REPUBLIC Corporation

Manufacturers of American La-France Trucks, Linn Tractors, Republic Trucks

Factories: Alma, Mich. • Morris, New York

Represented in:

New York City	Boston	Philadelphia	Chicago	Tulsa, Okla.	Salt Lake City	San Francisco
Skowhegan, Maine	Charlotte, N. C.	Pittsburgh	St. Louis	Omaha, Nebr.	Denver	Portland, Ore.
New Haven, Conn.	Memphis, Tenn.	Louisville, Ky.	Kansas City, Mo.	Sioux Falls, S. D.	Jerome, Ariz.	Spokane
Baltimore	Johnson City, Tenn.	Detroit	Little Rock, Ark.	St. Paul, Minn.	Los Angeles	

105 direct distributors located throughout the United States and 49 distributors located in 30 foreign countries

Canadian Linn Distributors: Mussens Limited, Montreal

LA FRANCE REPUBLIC LINN TRACTORS

Patent No. 1,270,631
Patent No. 1,521,454
Patent No. 1,685,641
Patent No. 1,685,676
Patent No. 1,701,979
Other Patents Pending

In writing to Linn Manufacturing Corp., Div. of La France-Republic Corp., please use post card bound in the center of this number.

LONG LIFE

●

● Long life of your chain is assured when you specify "TAYLOR-MADE" on your order.

● For over 57 years (since 1873) S. G. TAYLOR CHAIN COMPANY has maintained the leadership in the manufacture of chain—a position earned by continuous watchfulness to see that sound manufacturing processes are used in making each link. These fundamentals—the use of only superior quality materials, the employing of skillful craftsmen and the maintenance of rigid inspection—have been constant practice, for more than half a century.

● There are innumerable uses for chain on the job. Catalog "A" presents a wealth of data on chain which will interest you. A copy will be sent on request.

CHAIN THE STRONG LINK OF INDUSTRY THE CHAIN INSTITUTE

"BUY FROM YOUR LOCAL DISTRIBUTOR"

S. G. TAYLOR CHAIN CO.

P. O. Box 1297-B » Hammond, Ind.

ESTABLISHED 1873

SHOTS FROM THE FIRING LINE — Continued

Arkansas Notes

BY H. E. SNIPE

Justin Matthews Company of Little Rock is busy constructing a dam on their property at Park Hill. When completed this dam will form a lake of about 600 acres in the heart of the beautiful residential section at Park Hill. Mr. Matthews is using a Bucyrus-Erie Gas + Air shovel on the construction of this dam. Bob Massey is in charge of the construction and is certainly handling this job to perfection. George Harding, who is at the levers on the Gas + Air, is considered one of the best Gas + Air operators in the territory.

O. M. New of Camden, recently started excavation for grading highway No. 4 in Quachita County. This work consists of about 90,000 yards of sand and clay excavation. Mr. New is using a Bucyrus-Erie Diesel + Air on this job, with 2-yard Western dump wagons and mules. Mr. New reports that the Diesel + Air is going along fine. Mr. Romell is at the controls and is surely making the shovel perform beautifully.

San Francisco and Vicinity

BY D. W. EVANS

Hemstreet & Bell of Marysville, were awarded contract on their bid of 28c per cubic yard for the construction of 8,700 feet of levee on the left bank of the Feather River near the Lake of the Woods, about one mile above the mouth of the Bear River in Yuba County and three miles upstream from the town of Nicolans. Work involves 215,000 cubic yards of embankment. R. G. Le Tourneau of Stockton, California, has sublet the entire job from Hemstreet & Bell and will use Le Tourneau scrapers in the construction of the levee.

Contractors are showing considerable interest in the last section of the **Wawona Road into Yosemite National Park.** Bids will be taken soon by the United States Bureau of Pub-

Raising the outside rail preparatory to shifting track over to the edge of the dump. All the shifting and raising on this waste dump was done by a few men with the aid of a Track Machine. Wherever track must be shifted or raised and a track gang is maintained, this machine is a real necessity in reducing costs and speeding up work.

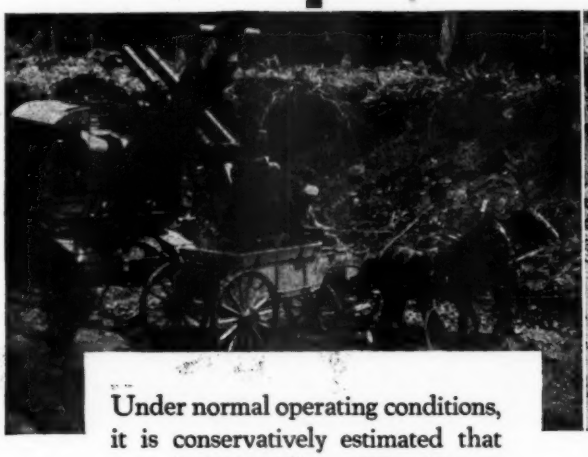
Write for Bulletin GR-8.

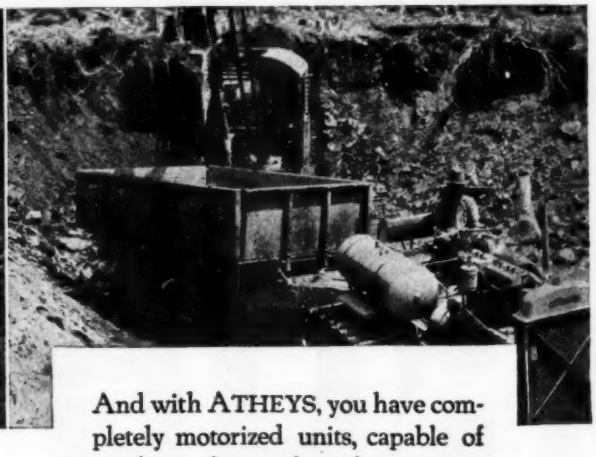
NORDBERG MFG. CO., Milwaukee, Wis.

THE NORDBERG PATENTED TRACK MACHINE

Let's be sensible

about the hauling problem





Under normal operating conditions, it is conservatively estimated that two ATHEY Three-Way Dump Trailers will keep a power shovel or elevating grader operating at full capacity, will haul more dirt per day than ten 1½-yard wagons and 30 mules.

This contrast shows tremendous savings by Atheys. You eliminate the wages of eight drivers, because the ATHEY is a one-man unit, controlled by tractor operator. This saving alone more than pays depreciation and maintenance. The fuel for the tractors is but a fraction of what it costs to feed and keep 30 mules—another very considerable saving.

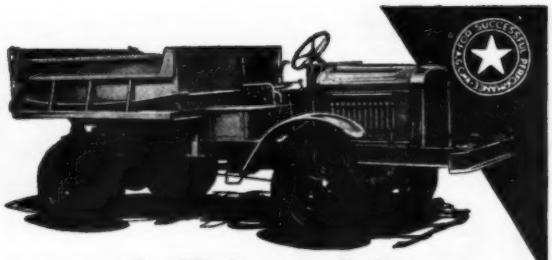
And with ATHEYS, you have completely motorized units, capable of working day and night, rain or shine, regardless of conditions of the cut or fill. The wide bodies facilitate rapid spotting of dipper, eliminating 75 per cent of shovel delays. They dump well over fill, eliminating bull-dozing costs entirely. The light running qualities permit tractors to operate at high speed, even with capacity 8-yard loads.

In addition, *ATHEYS dump either to the right, left or rear*—ideal for any job. Add all these advantages together and they prove how ATHEY economies are revolutionizing the dirt-moving industry. Write for complete information.

ATHEY TRUSS WHEEL CO. ··· 130 North Wells Street, Chicago, U. S. A.
Cable Address: "Trusswheel," Chicago The Baldwin Locomotive Works, Foreign Representatives, Philadelphia, Pa.

Athey
TRUSS WHEEL EQUIPMENT

For your convenience in writing Athey Truss Wheel Co. you will find a card bound in this issue.



3-yd Dirt Mover

MODEL 85-D is the new three-yard Hug Roadbuilder designed for dirt moving and excavation work. The new Hug model reflects the same sturdy features of Hug construction incorporated in previous Hug models. The entire truck has been engineered and built to stand up under the most severe operating conditions.

The Hug Roadbuilder will pay a profit on your job because it is built to operate continuously day in and day out under the most trying conditions and it is this type of performance that has established Hug reputation.

HUG

THE HUG COMPANY, Highland, Illinois

SHOTS FROM THE FIRING LINE — Continued

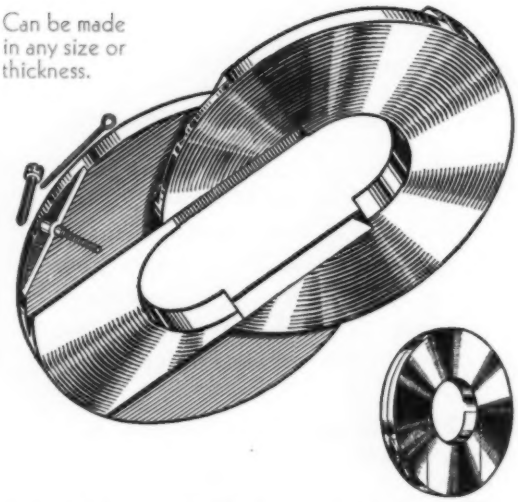
lic Roads for 3.6 miles of grading and tunnel, involving 100,000 yards roadway excavation, a 4230-foot tunnel 28 feet wide and 20 feet high, and 1050 feet of gallery excavation. This will be similar to the Mt. Holly tunnel road recently completed in Zion National Park.

Yglesias Brothers, San Diego, were awarded contract on their bid of $149,461 by the California Division of Highways for 4.3 miles grading and surfacing in Amador County from Amador City to Martell. Work involves 160,000 yards of excavation.

In excavating for the new buildings to be erected at the California School for the Blind at Berkeley at a cost of $65,000, **Ariss-Knapp Company of Oakland** use their Bucyrus-Erie Gas + Air shown above.

Quick Repair Washers Reduce Repair Costs

Can be made in any size or thickness.



The Quick Repair Washer consists of two brass sections that slide together, and are held in position with two screws inserted in the outer edge of the collar. Cotter pins prevent the screws from backing out.

Save the replacement cost of Gears and Pinions by keeping them in perfect mesh with QUICK REPAIR WASHERS.

They are also cheap insurance against costly delays and shut downs.

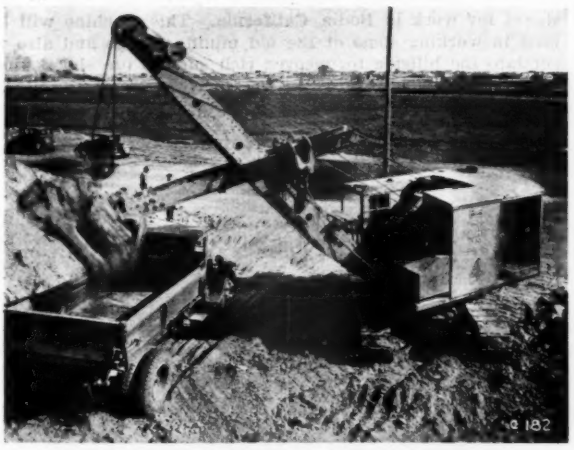
These washers can be put on a shaft easily and quickly without the delay and expense of tearing down or removing gears, pinions or other machinery parts, and yet stand the strain and hold up under constant use. This means eliminating a big percentage of your repair delay — means having the wheels of your whole plant rolling in a fraction of the time it would ordinarily require.

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

BUCYRUS ERIE

SHOTS FROM THE FIRING LINE — Continued

BY H. L. LIVINGSTON



Widening the State Highway between Newport Beach and Sunset Beach in California **Macco Construction Company** used the above Bucyrus-Erie Type 1030. The total excavation was 268,000 yards, consisting mostly of shale with some sand. Traffic had to be maintained on the highway at all times, considerably handicapping production records, but a good steady pace was maintained throughout the job. Superintendent Charles Davidson was in charge, and Operator Ernie Sifton handled the levers of the 1030.

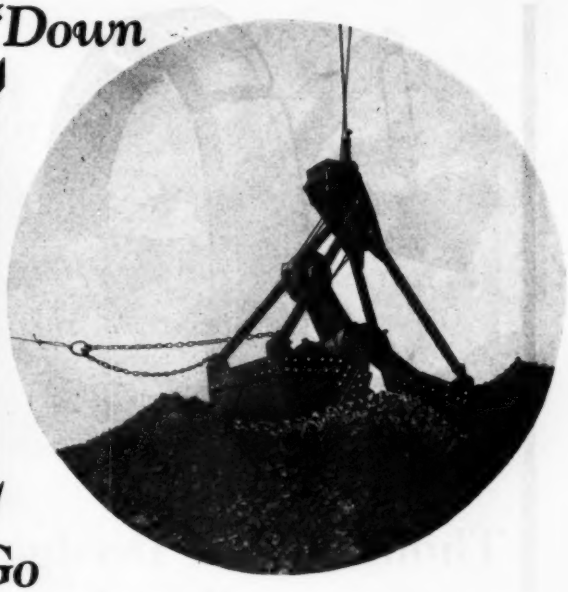
W. K. McMillan used Caterpillar and Ateco Dirtmovers preparing grade for a spur track to serve the $5,000,000 chemical plant being erected near Pittsburg, California. Six Caterpillar Sixtys, four Ateco Dirtmovers, an Ateco Scarifier, an orphan Elevating Grader, and several teams of horses were used in the earth-moving part of the job. The Dirtmovers moved 45 to 50 cubic yards each an hour on an average haul of 450 yards. Barrett and Hilp are the general contractors.

Buckeye

TRENCH EXCAVATORS
AND
BACKFILLER-CRANES

The Buckeye Traction Ditcher Co.
Findlay, Ohio

"Down

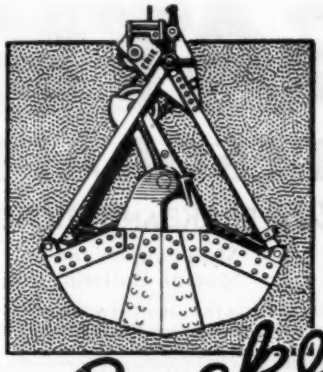


Go

ERIE
BUCKETS
Into the Material"
AND HOW!!

They dig in like the very devil with an uncanny, smooth action that makes the chills run up and down your back in wondering how the cranes will get them out.

Send for one of these buckets, and put it in the toughest digging you can find. Give it the 33rd degree. You won't need a week to discover the surprising amount of extra material you are moving above the capacity of the bucket. If you are not satisfied with the results, send it back — That's our guarantee.



Erie Buckets

Write for Catalog and Prices to

ERIE STEEL
CONSTRUCTION CO.
619 Geist Road ERIE, PENNA.

Thousands of Dredges ... Steam Shovels ... Drag Lines and Hoists

operate more efficiently . . more economically . . today . . because they are equipped with GATKE MOULDED BRAKE AND FRICTION BLOCKS! Friction troubles have been eliminated . . shutdowns for adjustments reduced! Positive control is assured . . . friction and brake response is accurate . . emphatic . . for every requirement.

ASBESGRAPHITE is the sure answer to every friction problem on industrial equipment! More power! Smoother operation!

Types and sizes for all classes of equipment.

GATKE

ASBESGRAPHITE

***MOULDED* BRAKE AND FRICTION BLOCKS**

Mail coupon for Special Bulletin.

THOMAS L. GATKE, MANUFACTURER.
228 N. La Salle St., Chicago, Ill.

Please send us latest bulletin on ASBESGRAPHITE Brake and Friction Blocks.

Name_____

Address_____

_____

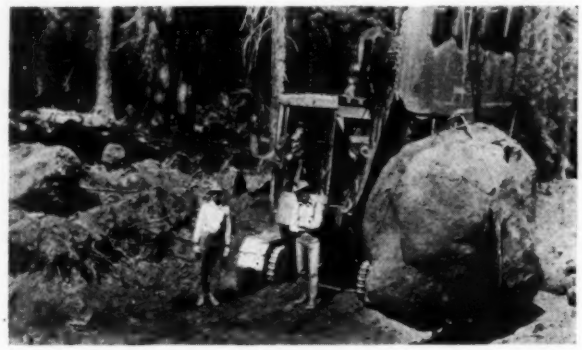
E E 11-30

SHOTS FROM THE FIRING LINE — Continued

The Treadwell-Yukon Company with headquarters in San Francisco has recently purchased a Bucyrus-Erie Gas + Air shovel for work in Bodie, California. This machine will be used in working some of the old mining dumps and also to cut into the hillside to uncover rich surface ore shoots that yielded very rich returns in the early years of the Bodie district.

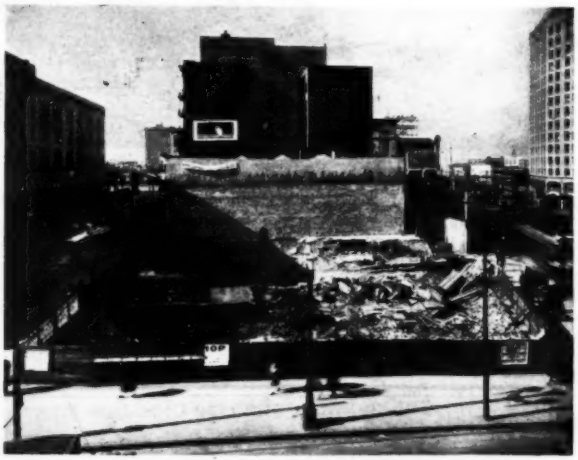
Oregon Notes

BY MARC D. TROYER



Operator Walter Short who is running a Bucyrus-Erie 1030 for Shaw Bertram Lumber Company of Squaw Valley, Oregon, sends the above picture. Mr. Short comments that it is "a testimony to the 1030's ability to do a tough job easily." He also calls attention to the ¾-inch line which is about to part where it was hooked over the tooth. Quite a few good-sized boulders in this stretch of logging road, but Walter and the 1030 like 'em that way.

Washington Notes



This healthy-sized Seattle basement was recently excavated by **R. J. Odman** at 4th and Pine. There were a number of old foundation walls to be torn out, but it didn't take long for Mr. Odman's Bucyrus-Erie Gas + Air to get down to grade.

MEETING PLACE OF CAPITAL AND LABOR

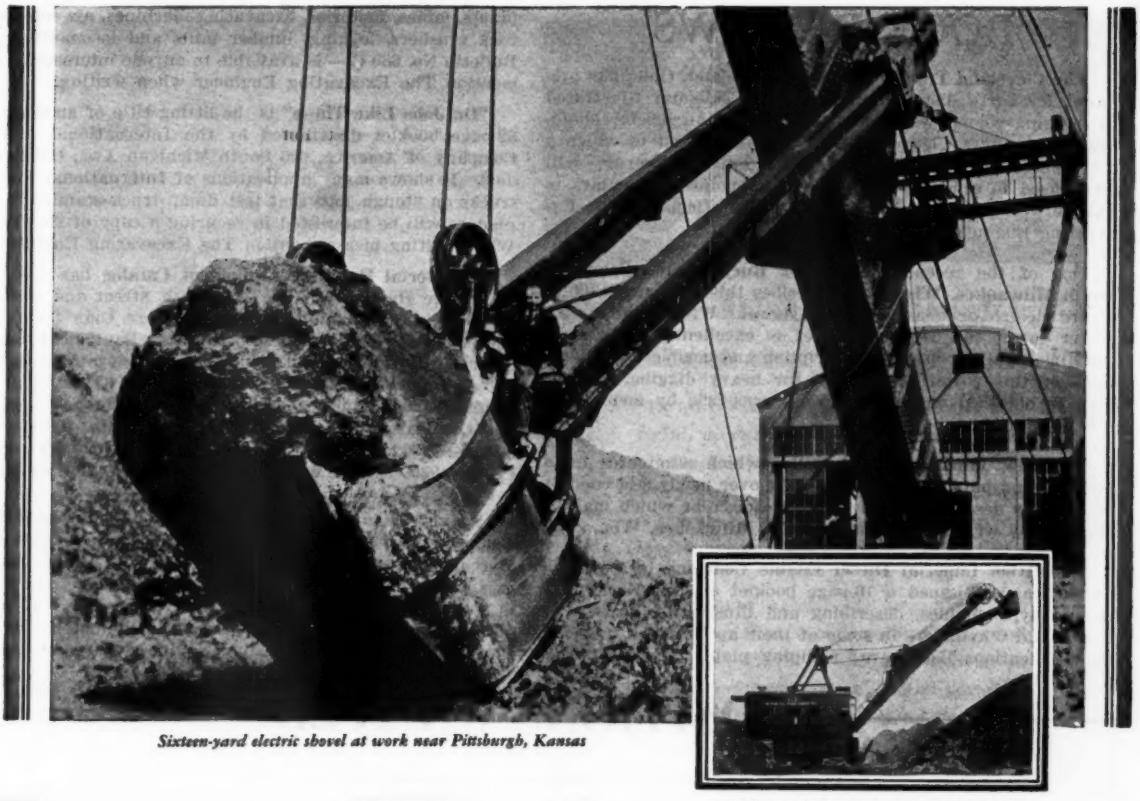
THE KOENIG LABOR AGENCIES

Established 1875

ST. LOUIS
612 Walnut Street
Main 2766 and 2767

KANSAS CITY
501 Delaware Street
Main 0796

HELP OF ALL KINDS FURNISHED FREE



Sixteen-yard electric shovel at work near Pittsburgh, Kansas

Twelve-yard electric shovel in coal-stripping work near Oakland City, Indiana

Titanic Tools - Electrically Driven

In every size from 1 1/2 to 16 yards, wherever a shovel is needed, G-E Motorized Power, behind the bucket, efficiently and abundantly furnishes driving power for electric shovels. For detailed information, call your local General Electric representative, or address the General Electric Company, Schenectady, N. Y.

GENERAL ELECTRIC

JOIN US IN THE GENERAL ELECTRIC PROGRAM, BROADCAST EVERY SATURDAY EVENING ON A NATION-WIDE N.B.C. NETWORK

THESE 12- and 16-yard electric shovels, huge enough to be tools of giants, are so adjusted and powered within that they are virtually the extension of a man's hand at work.

Smoothly, rapidly furnishing power for swinging, thrusting, and hoisting, G-E Motorized Power gives day-after-day dependability in performance. Ward-Leonard control enables expert ease in maneuvering the big shovels.

Forced ventilation of the G-E motors on the 12- and 16-yard electric shovels effects economy, because the resultant power increase makes possible the use of a smaller motor. G-E drive is remarkable for low maintenance cost and long, useful life.

200-336

SALES AND ENGINEERING SERVICE IN PRINCIPAL CITIES

For your convenience in writing General Electric Co. you will find a card bound in this issue.

BOOK REVIEWS

The Cleveland Tractor Company, Cleveland, Ohio, has prepared for early distribution their 1931 calendar illustrated in pleasing colors, with a reproduction of an official photograph showing a Cletrac pulling a mooring mast to which a dirigible is anchored. The Cleveland Tractor Company will be pleased to send one of these well-appointed calendars to anyone who will send in a request. Please mention The Excavating Engineer.

One of the recent bulletins of **Bucyrus-Erie Company, South Milwaukee, Wisconsin,** describes this company's 100-B, 3-yard electric or steam revolving shovel. With its attractive poster cover, the 24-page booklet is excellently illustrated, contains a full mechanical description and complete specifications of this powerful machine for heavy digging. Copies may be obtained on request to Bucyrus-Erie by mentioning this publication.

The new **Trackson** trench roller which eliminates hand tamping and puts back all of the dirt over newly-laid conduit and pipe is described in an attractive circular which may be obtained by writing the **Trackson Co., Milwaukee, Wis.**

The Atlas Imperial Diesel Engine Company of Oakland, California, has issued a 16-page booklet on full Diesel stationary type engines, describing and illustrating engines of 2, 3, 4 and 6 cylinders in some of their applications. Among the applications listed are: pumping plants, electric power plants, mines, factories, excavating machines, air compressors, rock crushers, logging, lumber mills and locomotives. This Bulletin No. 630-C — is available to anyone interested. Please mention The Excavating Engineer when writing.

"On Jobs Like These" is the fitting title of an illustrative 32-page booklet distributed by the International Harvester Company of America, 606 South Michigan Ave., Chicago, Illinois. It shows many applications of International Harvester trucks on "tough jobs that test dump truck stamina." Many readers will be interested in securing a copy of this bulletin. When writing please mention The Excavating Engineer.

A Material Handling Equipment Catalog has been issued by George Haiss Mfg. Co., Inc., 144th Street and Park Ave., New York City, manufacturer, for more than 30 years, of equipment for handling loose materials. Equipment listed and described in this catalog include screens, elevators, conveyors, gates, chutes, clamshell buckets, storage distribution systems, portable truck and wagon loaders, portable belt conveyors, and the Haiss "Excavator." A copy of this well-illustrated 80-page booklet may be had by asking the manufacturer for Catalog 230. Please mention this magazine when writing.

An attractive catalog of Hercules Explosives printed in the Spanish language, has just been issued by **Hercules Powder Company.** Intended as a reference book on explosives for Hercules' clients in Latin America the new booklet describes explosives, blasting accessories, and smokeless powder, and is well illustrated with Latin American scenes. It may be obtained by writing the company at Wilmington, Delaware. Please mention The Excavating Engineer when writing.

POSITIONS WANTED

Space under this heading is available at $5.50 per inch or fraction thereof.

Address all box numbers % The Excavating Engineer at South Milwaukee, Wisconsin

Clamshell—Crane—Shovel Operator

11 years' experience on railroad, grading, quarry excavation and building work, on all types of gasoline and steam machines. Prefer operating steam shovel anywhere in United States. Can do own repair work and furnish reliable references. Present location, Missouri. Box 3112.

Dragline Operator

Experienced on Bucyrus-Erie, Monighan and Marion machines. Have 10 years of dragline experience. Will go anywhere in United States. Can do own repair work and furnish reliable references. Present location, Arkansas. Box 3113.

Wrecking Crane Operator

15 years' experience on Bucyrus steam wrecking cranes, 150-ton capacity, on railroad work. Prefer work in East. Can make own repairs and furnish reliable references. Present location, North Carolina. Box 3102.

Dragline and Shovel Operator

8 years' experience on Bucyrus-Erie 50-B, 30-B, 41-B shovels and Class-14 draglines on sewer and general excavation. Can do acetylene welding. Prefer operating draglines. Can do own repair work and furnish reliable references. Present location, Michigan. Box 3103.

Crane—Clamshell—Shovel Operator

4 years' experience on Bucyrus-Erie clamshell and cranes, Diesel and gasoline-powered on bridge work and earth embankments. Prefer operating Bucyrus-Erie 50-B anywhere. Can do own repairing and furnish excellent references. Present location, Illinois. Box 3104.

Clamshell Operator

8 years' experience on Erie steam machines on general excavating and handling of materials. Prefer operating gas clamshell machine anywhere. Can do own repairing and furnish first-class references. Present location, Iowa. Box 3105.

Shovel Operator

9 years' experience on Erie steam machines on highway, gravel pit work, and making grades. Prefer operating Erie Type B anywhere. Can do own repair work and furnish reliable references. Married. Present location, Ohio. Box 3109.

Coal Mine Stripping Superintendent

20 years' experience as superintendent on coal stripping operations. Also have six years' experience as dragline and shovel operator on Bucyrus-Erie steam and electric machines. Can furnish full shovel crew. Can do own repair work. Excellent references. Present location, Kansas. Box 3107.

Dragline and Shovel Operator

12 years' experience on Bucyrus-Erie 20-B, 30-B, 50-B Diesels, 175-B Electric, Class-24, 9¼ and 230 draglines on levee work, highway grading, gravel stripping and phosphate excavating. Willing to go anywhere in United States. Married. Can do own repair work and furnish reliable references. Present location, Mississippi. Box 3114.

Shovel Operator

18 years' experience on Bucyrus-Eries, Thews, Marion and Osgood machines on highway and railroad work. Can operate electric, gasoline or steam shovels. Prefer work on any Bucyrus-Erie shovel anywhere. Can make own repairs and furnish reliable references. Present location, California. Box 3101.

Dragline and Shovel Operator

13 years' experience on Bucyrus-Erie, Marion, Osgood, Massillon and Byers draglines and shovels on highway and railroad grading, drainage and irrigation work and building excavations. Prefer job on Bucyrus-Erie. Employed four years last employer, eight years previous, can furnish good references from both. Can do own repair work, both in field and machine shop. All previous experience with steam machines, but would like opportunity to make good on gas, electric or Diesel, and is confident can handle any of these if given opportunity. Located at present in Maryland. 32 years old, single, will go anywhere. Box 3108.

Dragline and Shovel Operator

25 years' experience on Bucyrus-Erie, Thew, Osgood and Marion shovels and draglines, steam and electric-powered. Have worked on highway and railroad grading, drainage and irrigation with draglines and dredges. Experienced in iron ore, coal and phosphate mining. Can do own repairing. Prefer operating Bucyrus-Erie machine. Can furnish reliable references. Present location, Tennessee. Box 3106.

Dragline Operator

Experienced on Marion Electric draglines on drainage and stripping work. Will operate any make machine and willing to go anywhere in U. S. A. Can do own repair work and furnish good references. Present location, Illinois. Box 3110.

Dragline—Clamshell—Shovel Operator

Experienced on Bucyrus-Erie steam and gasoline shovels, sizes 50-B to 320-B, draglines, Class-14 to 320. Also experienced on Osgood, Marion, Northwest and Browning machines on all types of excavation and irrigation work. Willing to go anywhere. Can do own repair work and furnish first-class references. Present location, Indiana. Box 3111.

TRADE NOTES

The Owen Bucket Company of Cleveland, Ohio, announces the opening of a new branch office and warehouse in New York, located at 36-25 Twenty-second Street, Long Island City. This new office is in charge of Mr. Frank W. S. Elmes, well known in the material handling and construction fields throughout the East. A large stock of buckets and parts will be maintained, and complete bucket service including repairing facilities are available from this branch office.

The establishment of the **Wire Reinforcement Institute** with headquarters in the National Press Building, Washington, D. C., was recently announced by the manufacturers of welded wire fabric reinforcement.

The purpose of the Institute is to provide a centralized organization to exploit the technical and utilitarian merits of wire as used for concrete reinforcement. Sponsored and supported by the several companies engaged in the manufacture of welded wire fabric, yet wholly independent of the commercial interests of any single manufacturer, the Institute will function as a purely promotional organization, its activities including the assembly and dissemination of authentic information, data and statistics relevant to welded wire fabric and its uses.

The Gilman Manufacturing Company, East Boston, Massachusetts, makers of the Gilman line of rock drills, heat-treating machines, furnaces and accessories, is now a part of the **Worthington Pump and Machinery Corporation,** according to a recent announcement by Geo. H. Gilman, President, and L. J. Belnap, President of Worthington Machinery Corporation, New York, N. Y. This new association, according to Mr. Belnap, means an expansion of the Worthington line of pneumatic service to mines, quarries, contractors and industry.

Johnston in Central America

Civilisation reaches out its fingers and creates new problems New lands to be cleared, dams to be built, railroads to be constructed, all are jobs demanding the best in boiler equipment — all are jobs for JOHNSTON Boilers built especially for Contractor's equipment.

JOHNSTON BROTHERS, Inc.

Box No. 310 - FERRYSBURG, MICH.

OWEN CLAMSHELL BUCKETS

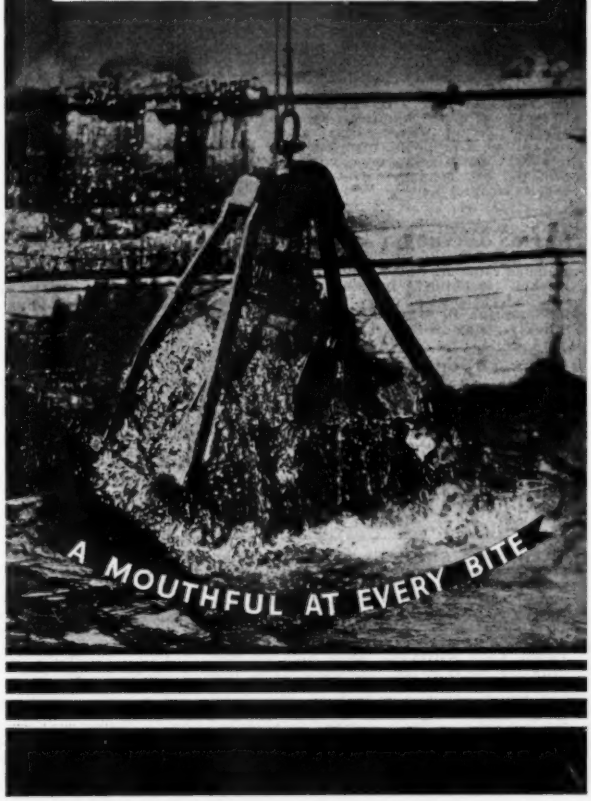
Owen Buckets

No! It's Not Finicky About the Kind of Job!

Put an Owen Bucket in any kind of material, anywhere, and it's right at home . . . digging in as usual . . . capacity grabs every time . . . frequent overloads. And it stands up under out-of-the-ordinary, severe usage. It will do a bigger day's work *on any job* than any other bucket of the same weight and capacity . . . a guarantee that has been making good ever since Owen Buckets have been in use. No matter what the job or the conditions, if it's bucket work, an Owen will do it better.

THE OWEN BUCKET CO.

6026 Breakwater Ave.
Cleveland, Ohio



FOR SALE

Space under this heading is available at the following rates, payable in advance of publication:

1 to 3 inches.....$5.50 an inch net
4 to 7 inches..... 5.25 an inch net
8 to 14 inches..... 5.00 an inch net

An inch is measured vertically on one column — three columns to a page. Any space may be used measured by the even inch in height and by one, two or three columns in width.

The price per inch is based on total space used — multiply ad space by number of continuous insertions.

Address all box numbers c/o The Excavating Engineer at South Milwaukee, Wisconsin

Small Shovels
Under 2 yards

MARION ELECTRIC SHOVEL, Model No. 36. **MARION STEAM SHOVEL**, Model No. 36. Location Central Ohio. Box 1204-A.

TYPE "B" ERIE STEAM SHOVEL, caterpillar mounted, equipped with 21-foot boom, 18-foot dipper handle, boom hoist, ¾-cubic-yard dipper; sold new 1924; just completely overhauled; price reasonable; located vicinity of Chicago. Box 41-SS.

TYPE 3-A THEW, located near Crowder, Oklahoma. 31-foot boom, 24-foot handle, 1 cubic-yard dipper. Shop number 2150. Shovel used very little. Equipped with new boiler. For immediate delivery. Address Box 805.

MARION MODEL 37 ELECTRIC SHOVEL suitable for 3-phase, 60-cycle, 440 volts, equipped with 32-foot boom, 22-foot handles, and 1¼-cubic-yard dipper, on caterpillar mounting. Machine in very good condition. Located near Pittsburg, Kansas. Price reasonable. Box 90-SS.

TWO TYPE "B" ERIE STEAM MACHINES, mounted on "cats," ¾-cubic-yard dippers, shop numbers 2300 and 2301, 19-foot booms and 16-foot dipper handles. Box 83-SS.

RECONDITIONED TYPE-A ERIE STEAM SHOVEL on caterpillars. ⅝-cubic-yard dipper, 16-foot boom, 13-foot dipper handle, boom hoist, Massachusetts boiler. Machine thoroughly inspected, worn parts replaced. Guaranteed to be in first-class operating condition. Will rent or sell. Box 37-SS.

ONE NORTHWEST SHOVEL, 28-foot boom, 16-foot dipper handle, 1¼-cubic-yard bucket, 90 h.p. Twin City motor, new caterpillar, new boom, open cab, purchased late 1925, machine in good working condition and can be demonstrated at any time —price around $5,000. Box 113-SS.

ONE P. & H.-204 ½-CUBIC-YARD COMBINATION GAS SHOVEL AND CLAMSHELL, shop number about 2220. New 35-foot clamshell boom, and ½-cubic-yard Owens Bucket. Machine is in good condition and has had the best of care. Can be inspected in operation in Milwaukee. Priced to sell quickly. Box 99-SS.

MARION SHOVEL, Model 220 or 212, Shop No. 3141. In first-class condition. 45-foot camel-back boom, 28-foot dipper sticks, 1¾-yard dipper. Also dragline boom for this machine. Box 805-C.

MODEL No. 21 MARION STEAM SHOVEL, high lift boom and forward drum, in excellent condition, boiler just retubed, location Baltimore. Price $5,000.00. Address Box 1101.

NORTHWEST SHOVEL, model 105, caterpillar mounted. 24-foot boom, 1-cubic-yard dipper, 16-foot dipper handle. In good condition. Price $4,500, f. o. b. Utica, New York. Box 34-SS.

MARION TYPE 32 COMBINATION DRAGLINE AND SHOVEL, shop number 5683, dragline boom 50 feet, one-cubic-yard drag bucket included. Shovel boom 24 feet, dipper handle 17 feet 6 inches. Manganese front dipper 1¼ cubic yards. Machine purchased new October 1926, original cost $17,500. Will sacrifice and offer terms to reliable party. Located in vicinity of San Antonio, Texas. First-class condition. Address Box 1004-A.

MARION MODEL 32, shop No. 5459, mounted on "cats," steam-powered, 1¼-cubic-yard dipper, 24-foot boom, 17-foot 6-inch dipper handles. Box 82-SS.

TYPE "B" ERIE STEAM SHOVEL, caterpillar mounted, 19-foot 8-inch boom, 16-foot dipper handle, ¾-cubic-yard dipper, power boom hoist. In good condition. Located Northern Indiana. Box 81-SS.

RECONDITIONED TYPE B SHOVEL, shop number approximately 3100, caterpillar mounted, ¾-cubic-yard inserted tooth dipper, 19-foot 9-inch boom, 16-foot 4-inch dipper handle, power boom hoist. Guaranteed. Will rent with option to purchase. Price on application. Box 40-SS.

TYPE B ERIE HIGH LIFT SHOVEL, shop number 3175, mounted on spur gear caterpillars, equipped with 19-foot 9-inch boom, 16-foot dipper handle, ¾-cubic-yard dipper, boom hoist, two-speed travel mechanism. Box 87-SS.

TYPE "A" ERIE STEAM CLAMSHELL MACHINE, mounted on traction wheels, equipped with 26-foot boom; to operate ½-yard bucket; shipped new 1921. Located southern Iowa. Priced very reasonable. Box 31-SS.

MODEL 20-B BUCYRUS GASOLINE SHOVEL AND CLAMSHELL MACHINE, shop number in 4800 series; mounted on full caterpillar; equipped with high lift gooseneck shovel boom and ⅞-cubic-yard dipper, also 36-foot clamshell boom and ¾-cubic-yard clamshell bucket. Machine in good working condition. May be inspected at Omaha. Reasonably priced. Convenient terms may be arranged. Box 55-SS.

BUCYRUS 30-B STEAM MACHINE, shop number 3578. Has seen approximately eight years' service. Equipped with new boom and boiler. Reasonably priced. Located New York State. Box 72-SS.

MARION MODEL 7 ONE-YARD STEAM SHOVEL. Shop number around 6000. Good condition. Price $5,000. Box 101-SS.

ORTON SHOVEL, new 1928. 16-foot 4-inch boom, 12-foot dipper handle. ⅝-cubic-yard dipper. Inquire Clyde Equipment Company, Seattle, Washington. Box 100-SS.

TYPE "B" ERIE HIGH-LIFT SHOVEL. Shop number about 1115. 19-foot 6-inch boom, 16-foot dipper handle, ¾-cubic-yard bucket, Caterpillar mounted. In good operating condition. Cheap. Location Central Illinois. Box 104-SS.

ONE 18-B BUCYRUS, ⅞-yard dipper on full revolving caterpillars. Box 505-A.

OSGOOD HEAVY-DUTY, GASOLINE-DRIVEN, 1-YARD COMBINATION DRAGLINE-CLAMSHELL MACHINE, on cats equipped with 40-foot boom, 6-cylinder Beaver motor, starter and lighting plant operating from generator. Machine 2 years old. Located Central Illinois. Priced to sell. Address Box 1106.

TYPE "B" ERIE STEAM SHOVEL, shop number 2019, mounted on new caterpillar type traction purchased late, spring of 1929. Equipped with new 19-foot 9-inch boom, 16-foot dipper handle and ¾-cubic-yard dipper. First-class condition. Price $3,750 F. O. B. Louisville, Kentucky. Box 12-SS.

OSGOOD STEAM SHOVEL, 1¼-cubic-yard dipper, caterpillar mounted. Shop number 1397, priced f. o b. cars, Summittville, Tennessee. Box 86-SS.

BUCYRUS-ERIE GAS + AIR SHOVEL, shop number approximately 9800, equipped with 22-foot 6-inch boom, 16-foot dipper handle, one-cubic-yard inserted tooth dipper, power boom hoist. Mounted on single shaft caterpillar-type mounting. Has moved only 40,000 yards of material. Located vicinity of Poughkeepsie, New York. Box 96-SS.

REBUILT GA-2 ERIE SHOVEL mounted on new single shaft caterpillar, 1-cubic-yard inserted tooth dipper, 22-foot 6-inch boom, 16-foot dipper handle, starter. Carries guarantee of new machine. Box 43-SS.

TYPE "A" ERIE STEAM SHOVEL, shop number about 1900, caterpillar mounted, 16-foot boom, 14-foot dipper handle, ⅝-cubic-yard dipper, boom hoist. In first-class condition. Located Chicago vicinity. Priced to sell. Box 69-SS.

ONE P. & H.-400 ¾-CUBIC-YARD GAS SHOVEL — shop number about 3650, equipped with oversize motor and reinforced boom. Machine is one year old, and has seen very little service. Located in Southern Wisconsin. Box 98-SS.

ONE D-2 COMBINATION HIGH-LIFT DIESEL SHOVEL AND DRAGLINE; equipped with 26-foot dipper handle, power boom hoist, caterpillar mounted; and including brand new 40-foot boom dragline attachment, with 1-cubic-yard Class "S" Page bucket. Shop number about 9960. New August 1928. Located vicinity Minneapolis. In excellent condition. Priced to sell. Box 97-SS.

TYPE "B" ERIE STEAM SHOVEL, caterpillar mounted, equipped with 21-foot 3-inch boom, 18-foot 6-inch dipper handle, power boom hoist, ¾-cubic-yard dipper; in excellent condition; just installed $400 worth of repairs. Located vicinity Kansas City. Box 80-SS.

NORTHWEST DRAGLINE, Model 105, shop number in 2000's; 45-foot boom, fairlead and no bucket. In good condition. $3000.00. For further particulars address communications to Box 114-SS.

OSGOOD GASOLINE DRAGLINE, 1¼-cubic-yard bucket. 22-foot boom, 16-foot dipper handle, manganese front dipper, 4-cylinder Le Roi motor, 125 h.p., 45-foot boom, fairlead, no bucket. $6000. For further particulars address communications to Box 115-SS.

Small Draglines
Under 2 yards

30-B DIESEL DRAGLINE with 40-foot boom and 1-cubic-yard bucket located in Alabama. Box 91-SD.

SARGENT DRAGLINE with 45-foot boom, 1½-cubic-yard Page bucket, on cats. Machine in good working condition. Located in Central-Eastern Illinois. Price $3500.00. Address Box 1103.

MARION MODEL 261 DRAGLINE with shovel equipment. Shop No. 3277. Truck mounted. Recently overhauled and rebuilt. In excellent condition. Located near Minneapolis, Minnesota. A number of extra parts with the machine. Priced very reasonable for immediate sale. Address Box 606-A.